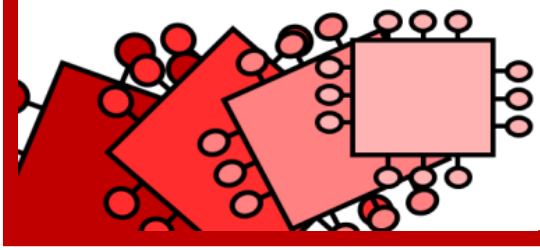
This exemplar Pearson Edexcel Level 3 Extended Project (Artefact) work was produced by a Year 12 student

Exemplar Project

This EPQ overall was given Grade B with a mark of 42/54.

The grade was not adjusted during moderation.

The overall mark for each Learning Object was:
AO1 (Be able to identify, plan and manage a Artefact or design) – 8/9
AO2 (Be able to research and select appropriate techniques and materials) – 10/12
AO3 (Be able to produce an artefact or design, using appropriate techniques and materials) – 17/24
AO4 (Be able to present project outcomes and an evaluation to an audience.) – 7/9
This file will show you in detail how the best fit grading approach was applied and how to effectively tackle the necessary evidence required for the Project Proposal Form, Project Activity Log, Research, Skill Development and Artefact and the Presentation. This exemplar should only be used for informational purposes only and to give an idea of how to tackle the Extended Project and not as something to copy from. Plagiarism of this exemplar most likely will be detected on your assignment if not credited appropriately.



Client:

Transportation – London's transportation network – Transport for London

Havering Council

Possible titles:

Transportation:

Should Transport for London's history be forgotten?

Should disabled people have to suffer with being unable to travel across London?

Should Havering be isolated in terms of transport compared to other local boroughs?

Should the mobility buses of London be brought back for the disabled?

Should we allow HS2 (High Speed 2) to be removed from London after how much money was spent on the line?

Should we allow Eurostar services to remove their stops at Ashford and Ebbsfleet indefinitely?

Computing:

Should AI be allowed to turn rogue one day?

Should people have to suffer with the "digital divide"?

Should computers be allowed to separate people who are "less tech savvy" and people who "know computers like the back of their hands"?

How have computers changed the way we live our lives?

Should we allow AI to replace the future jobs of humans?

Is there a way that the elderly can stay connected within social networking?

Should Computer Science and IT be the norm of future jobs?

Should all Internet search queries you search be tracked and stored by Internet Service Providers?

Photography – taking photos of some artefacts/historical parts of Transport for London

Musical compositions – creating songs using software

I have been commissioned by the Department of Transport to do an investigation into whether we should allow High Speed 2 services to be removed from London Euston after the high economical cost it took to begin constructing the line. I am going to produce a series of original photographs for the Department of Transport.

I have been commissioned by Eurostar to do an investigation into whether Eurostar should be allowed to remove their High Speed 1 stops at Ashford International and Ebbsfleet International indefinitely. I am going to produce a series of original photographs for Eurostar.

I have been commissioned by Opera to do an investigation into whether Internet Service Providers should be allowed to track and store Internet search queries that have been searched by users using the Internet. I am going to produce a series of original photographs for Opera.

I have been commissioned by Transport for London to produce a series of original photographs into whether the mobility buses of London should return for the disabled.

I have been commissioned by Havering Council to produce a series of original photographs into whether residents feel that Havering is isolated in terms of public transportation compared to other nearby local London boroughs and Essex.

Do Havering residents feel isolated in terms of public transportation compared to nearby local London boroughs and Essex? – a series of original photographs commissioned for Havering Council

P304 - Project Proposal form

Learner Name: **Learner number:**

Centre Name: **Centre Number:**

Teacher Assessor: **Date: 1/10/2024**

Unit: **P304**

Proposed project title: Do Havering residents feel isolated in terms of public transportation compared to other London boroughs and Essex? - a series of digital design maps commissioned for my client Havering Council.

Section One: Title, objectives, responsibilities

Title or working title of project (in the form of a question, commission, or design brief):

Do Havering residents feel isolated in terms of public transportation compared to other London boroughs and Essex? - a series of digital design maps commissioned for my client Havering Council.

Project objectives (e.g., what is the question you want to answer? What do you want to learn how to do? What do you want to find out?)

- **My aim is to find out whether residents of Havering feel that they are isolated and unable to go anywhere and whether Havering is more isolated in terms of transportation available to people compared to other local London boroughs and Essex.**
- **I am going to find out recent occasions since the late 1990s that Havering has been struggling with reliable transportation whether in terms of bus routes operated by Transport for London or by a non-London transportation company, train services including the London Underground, London Overground and National Rail services including c2c as well as transportation outside the borough in Essex and other London boroughs and how they compare with Havering.**
- **I am going to investigate the pros and cons of introducing and withdrawing services whether being bus routes or train services in the area and how this can affect people in the local area.**
- **I will find out statistics regarding the percentage of withdrawals in recent years compared to other boroughs and Essex.**
- **I want to learn how to edit designs as designs when edited can show an elevated level of skill.**
- **I will create examples of routes using designs and edit these using a paint application to show specific routes whether be train or bus that could be introduced or extended to locations within Havering to support local communities and make them feel less isolated if they were to be implemented.**
- **I want to create a presentation and present just how much people in Havering are suffering in terms of transport compared to other local boroughs.**
- **I am going to present my final project once I am doing my presentation in the week of the 31st of March 2025.**

If it is a group project, what will your role or responsibilities be?

N/A

Section Two: Reasons for choosing this project

Reasons for choosing the project (e.g., links to other subjects you are studying, personal interest, future plans, knowledge/skills you want to improve):

- I am an enthusiast in transportation and have been interested in transportation in my local community for many years since I was young, and I have also always wanted to take photos of my local area showing just how much the transportation in our local area needs to be reformed.

- As a BTEC IT and A Level Computer Science student, I really enjoy the form of abstraction and decomposition involved in the making of transportation for specific routes to go wherever they need to go, and I therefore plan to use abstraction and decomposition throughout my project.

- I want to learn new skills such as the art of designing digital maps as creating these maps can show just how much Havering Council residents are suffering without this public transportation as well as giving residents who are currently isolated some relief that public transportation could come to their area and how this service could operate.

- Further, I am interested in ways of how Havering public transportation across the borough could be improved and how if it is not changed many people will suffer, especially considering it needs to be reformed. With my pride for A Level Computer Science, I could make specific maps of routes that could be introduced or extended using photography and a paint application.

- I have chosen to be commissioned by Havering Council as this is both the borough where I spend most of my time in across the entire week. Many of my friends, relatives and disabled and vulnerable people including the elderly live in the borough, and it is important to ensure that all people in the borough can access some form of transportation.

- The skills that I acquire from my EPQ will allow me to demonstrate my ability to make designs which is important in university later as most universities require people to have at some point make designs as well as to work in the transportation sector in the future for Havering Council or Transport for London.

- This subject in which I am doing my EPQ is important nationally as there has been data across the country of public transport services being cut during the 14 years of Conservative Party government and even in the Labour government prior to 2010, especially in London and Essex, as in the case of bus routes across the country where 8,000 fewer bus services were registered with England's bus regulator compared to 2010 which was a fall of 50%. https://www.independent.co.uk/news/uk/politics/map-bus-routes-cut-labour-b2388980.html/

- According to information published by Juila Lopes MP, the Member of Parliament for Hornchurch and Upminster, Transport for London and the Mayor of London decided to continue supporting the withdrawal of Route 347 as of 21st August 2024, which is the main and only London operated route, running only four times on Mondays to Saturdays, linking

residents of the Cathedral Estate in Cranham and Clay Tye Road residents in North Ockendon to Romford and Upminster, after deciding to keep the route "under review" since 9th March 2024. This just proves how public transportation is important to residents in Havering, especially the elderly and disabled, considering how 70% of the passengers on Route 347 are Older Person's Freedom Pass holders.
https://www.julialopez.co.uk/news/julia-lopez-mp-condemns-tfl-withdrawal-347-bus-route/

Section Three: Activities and timescales	
Activities to be carried out during the project (e.g., research, development of ideas, production of final outcome, evaluation)	How long this will take
Research: I will use this time to research recent occasions since the late 1990s that Havering has been struggling with reliable transportation whether in terms of bus routes operated by Transport for London or by a non-London transportation company, train services including the London Underground, London Overground and National Rail services including c2c as well as transportation outside the borough in Essex and other London boroughs and how they compare with Havering. I will use a mix of primary and secondary sources in my research and from there consider which districts would be the best to base my designs on. I am going to investigate the pros and cons of introducing and withdrawing services whether being bus routes or train services in the area and how this can affect people in the local area. I will find out statistics regarding the percentage of withdrawals in recent years compared to other boroughs and Essex. I will find out recent occasions across all districts of Havering and from that work out the percentage per district of withdrawals and then compare these to all the districts in Havering. I will use this research to plan where I will create designs of routes that could help these areas if introduced or extended.	Project proposal form: till 15.11.24 15:45 Research of Havering's decline of public transportation and the isolation of its residents as well as statistics: till 20.12.24 23:00
Development of Ideas: I will develop designs of routes that Havering could introduce using Paint 3D as the painting program as well as OpenStreetMap for the map application as OpenStreetMap goes into more details of locations compared to other map applications like Google Maps. Look at older maps as far back as the late 1990s and decide if some of these routes could be reintroduced or extended. Implement abstraction by removing unnecessary details in my designs of routes by cropping out unwanted scenery and removing street names while keeping the main town names that the designs will serve. Implement decomposition by breaking down big problems into several small problems like in my specific locations by breaking each district of Havering down into several smaller areas within these districts which are not served by public transportation and base these specific locations as the places where I should create maps.	Skill Learning and Development of Ideas: till 20.1.25 23:00
Making the designs: I will find possible painting programs such as Paint 3D and mapping programs like OpenStreetMap to produce digital design maps of routes/public transportation services Havering could introduce which will make residents of Havering feel less isolated and bring communities in these districts together. I will use my skills of abstraction in digital design maps to remove unnecessary details such as unwanted scenery and street names. I will use my skills of decomposition to break each district of Havering down into smaller areas which are suffering with local transport as this will help me base specific locations where the maps will be based. I will create these digital design maps to show just how much residents are	Creation of digital design maps of local areas: till 15.02.25 23:00

suffering without adequate transportation, and I will create these digital design maps to show how these areas could be improved with bus services or train services or any other services I may have researched and included in my designs. **Writing about the designs:** Once I have successfully created my designs, I will write about what went well and what could need improving as well as how designing the route went. I will annotate my designs saying any major roads/public spaces/main town centers that that route will serve, alongside any train stations to connect with other services. I will show how I have incorporated abstraction and decomposition into my designs and why I chose to use these in my project. I will show how I have incorporated my research into making the designs and how these designs will help reduce the isolation of residents from public transportation using statistics. I will write about the benefits and disadvantages of introducing these designs, including how residents will be affected, economic requirements and social requirements. I will say how I have met the requirements of public transportation in Havering to ensure my approach works for its purpose. **Conclusion & Evaluation:** In my conclusion, I will summarize my journey of creating the designs and how I was successful to fulfil my title and whether I have been able to create an original approach to public transportation in Havering that would no longer isolate residents and be cost effective to Havering Council while driving in high amount of passengers. I am going to prepare and practice for my final presentation to talk about and show in which ways I have been able to create this original approach to public transportation in Havering. I will be able to present my journey on a PowerPoint presentation alongside the designs to show the entire journey and research required to be able to finish my designs. I will reflect on my entire EPQ and say what went well and was strong and what would need improving. I will say how I have fulfilled the requirements for Havering Council and whether my designs would be successful for their requirements.	Presenting and annotating the designs: till 20.03.25 23:00 Final Presentation and Conclusion: 31.03.25

Milestone one (20.12.24 23:00):

By the following time I am to finish my research on public transportation in Havering as well as all research on possible routes and how to use decomposition and abstraction in the making of the designs. I plan to finish the development process of my designs by deciding on specific locations within different districts of Havering. Therefore, I would have a clear idea of the style and materials I will use within my designs.

Target date (set by tutor-assessor):

Milestone two (20.01.25 23:00):

At this point, I should have started to create my designs. I will highlight how they are linked to my client, Havering Council, and start to show annotations surrounding the designs, which would show how they would remove the isolation of residents in Havering. This would be before my final presentation.

Target date (set by tutor-assessor):

Section Four: Resources

What resources will you need what will you use them for? (e.g., libraries and research, physical resources, technology and equipment, finance, etc.)

To complete my research:

- I will use the computers and use transportation websites, as well as the Mayor of London's website and Google to find out how previous designs of transportation in the area were taken.
- I will be using computers to make my PowerPoint and write about my designs and photographs and present my research.
- Use the internet to research websites of current London public transportation routes that exist and websites about public transportation and Havering policies.
- I will find possible painting programs such as Paint 3D and mapping programs like OpenStreetMap to create the designs and develop my ideas of routes.
- I will work on my EPQ project at home, in and outside of lessons in college to complete research and produce a design.
- I will use the library (the LRC) to loan books regarding transportation in Havering and why these were created.
- I will use my primary sources at home, including old bus maps dating as far back as December 1996 to research what routes could be reintroduced and get ideas of routes that could fix the isolation of residents.
- Use the TfL websites to find out statistics and consultations regarding the withdrawals of routes in Havering and how these have or would have affected people.
- Use the Mayor of London's website to find out when public transportation has declined in Havering as far back as the late 1990s.
- I will use other primary sources such as tallies and bar charts to show whether residents feel isolated and to gather statistics into whether Havering's transportation needs to be reformed.
- I will use academic articles including articles from Google Scholar to support my research and provide further evidence that Havering's transportation system needs reforming.

Comments and agreement from tutor-assessor

Comments (optional):

I confirm that the project is appropriate.

Agreed: (name) (date)

Comments and agreement from proposal checker

Comments (optional):

I confirm that the project is appropriate.

Agreed: (name) (date)

Project Activity Log

Learner Name: **Learner number:**

Centre Name: **Centre Number:**

Unit Name: Artefact **Unit number: P304**

Teacher Assessor:

Proposed project title: Do Havering residents feel isolated in terms of public transportation compared to other London boroughs and Essex? - a series of digital design maps commissioned for my client Havering Council.

This form should be used to record the process of your project and be submitted as evidence with the final piece of work.

You may want to discuss:

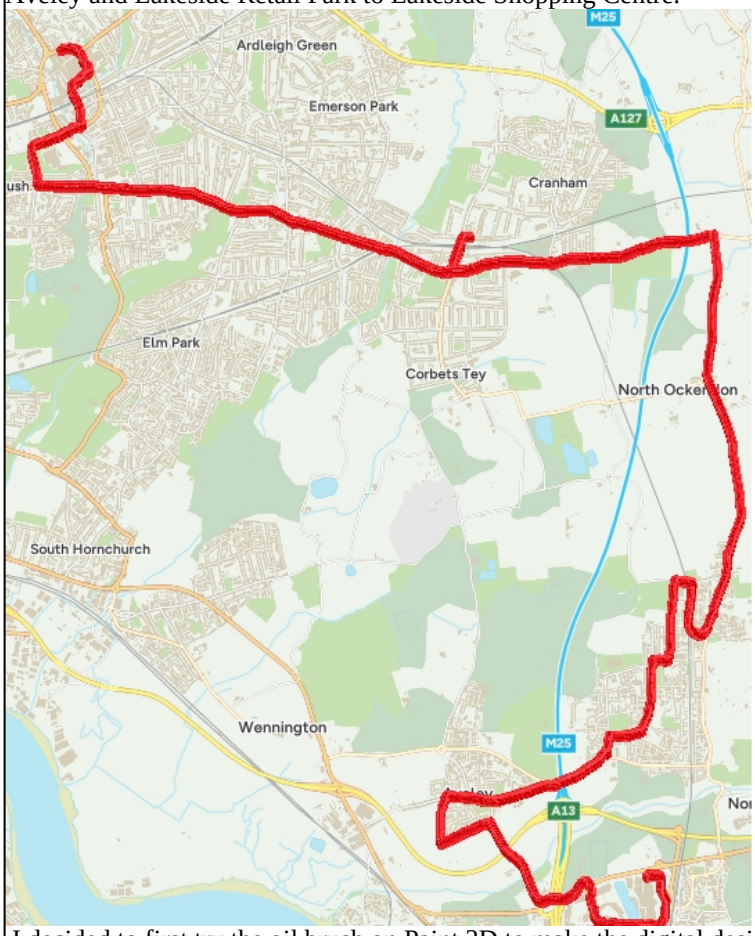
- what you have done (eg, from one week to the next)
- if you are working in a group, what discussions you have had
- any changes that you have or will need to make to your plans
- what resources you have found or hope to find
- what problems you are encountering and how you are solving them
- what you are going to do next

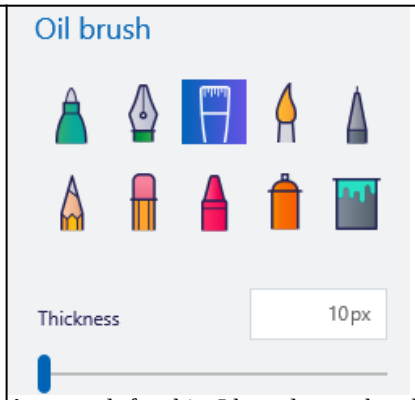
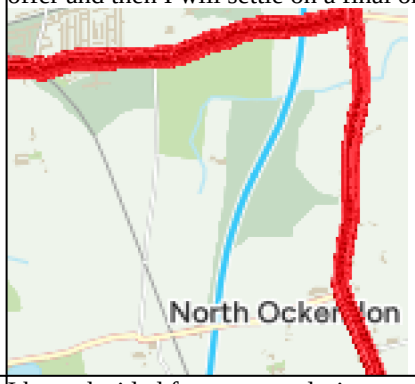
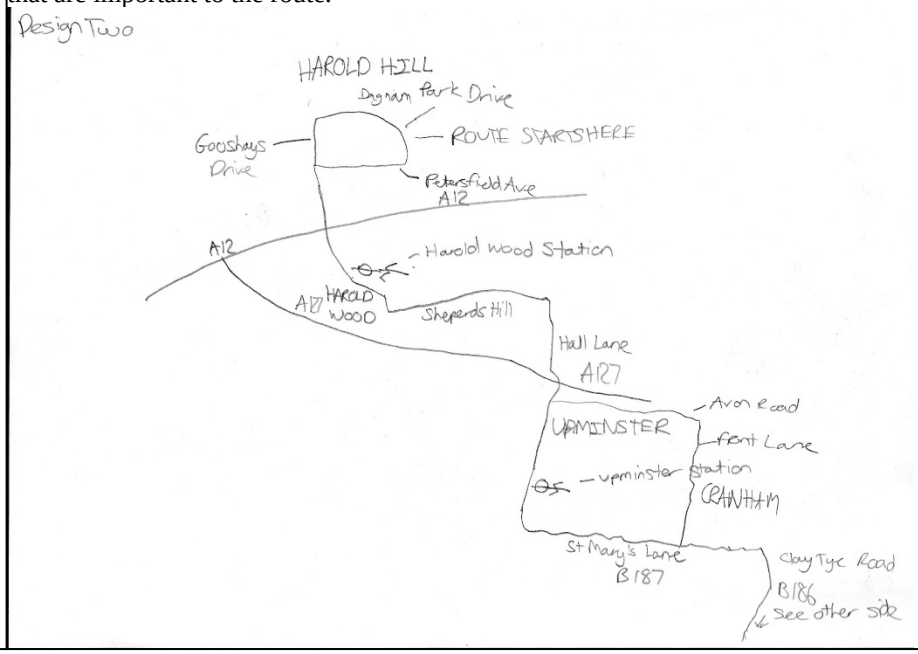
Date	Comments
27/9/2024	I was thinking about my title for the EPQ and produced a couple of ideas that I wanted to do for my EPQ including transportation and computing as I am interested in these subjects. I was informed by my teacher about how the course worked including how it is worth half an A level and how you can do the project in formats like photography and videography, which I wanted to improve my skills on. I was also informed about how many hours the course takes for the research which can involve secondary and primary sources. I am thinking my title could be about transportation in my local area and how it is declining, and I could use photography and videography with this research. I will not be working in a group throughout this project and instead will be doing the project on my own. The reason I am thinking about doing transportation is because I have noticed recently that several bus routes in Havering connecting the disabled and elderly and general people are being withdrawn and have been since around 2002.
1/10/2024	I have decided on a title today and am now going to carry out research on specific districts throughout Havering regarding transportation and the statistics of the number of withdrawals in recent years compared to other London boroughs and Essex alike and make a rough percentage of it which I can show alongside my photographs towards the end. I am going to focus on right now researching recent occasions since the late 1990s that Havering has been struggling to have adequate and reliable transportation in terms of bus routes (including those operated by Transport for London and other operators), train services including the London Underground, London Overground and National Rail including c2c and how these compare with other London boroughs and Essex.
4/10/2024	I have found out some initial research today regarding a recent decision made on the 21st of August 2024 by the Mayor of London and Transport for London regarding a local bus route in Havering called Route 347, which runs only four times a day Monday to Saturday, between Romford and Ockendon Station. Transport for London has decided to continue supporting the withdrawal of Route 347, even though it is the only London operated route that serves the Cathedral Estate in Cranham and Clay Tye Road in North Ockendon and 70% of Route 347 passengers are holders of Older Person's Freedom Passes, and the fact that they decided to keep the route "under review" since 9th March 2024. This just proves how much Havering's public transportation system is inadequate and

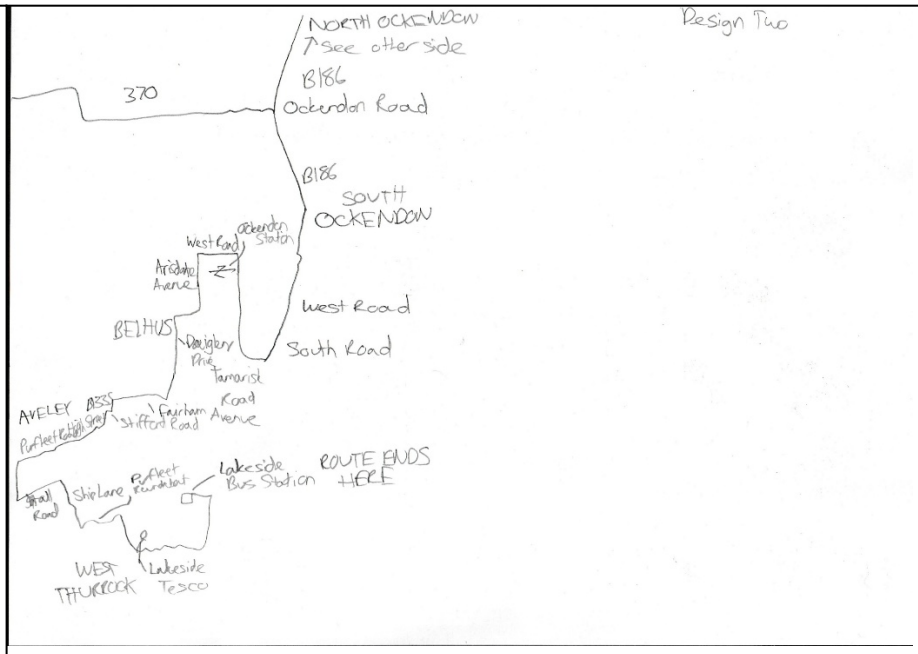
	requires reforming, which Transport for London and the Mayor of London clearly do not want to seem to provide. https://www.julialopez.co.uk/news/julia-lopez-mp-condemns-tfl-withdrawal-347-bus-route/ I am going to focus on researching more occasions where Havering has suffered with inadequate transportation due to Transport for London and the Mayor of London, as well as when services not operated by London boroughs were withdrawn.
6/10/2024	I have found out about a former commercial service numbered Route 373 from the Mayor of London's website, which at the time before withdrawal on March 30, 2008, operated between Upminster Station and Grays. It was operated on a London Local Service Agreement from Arriva. Most of the route at the time before withdrawal was in Thurrock, but prior to April 28, 2007, according to the Timetable Graveyard, ran from Romford Market to Grays. The concern regarded for the withdrawal for this route was that people living on Aveley Road, Harwood Hall Lane and part of Romford Road in Havering would be left entirely without a bus service, and Aveley Road has no pavement which makes it impossible to walk up the road alongside heavy volumes of traffic on the road. Although only fewer than 20 trips per day were being made to and from Aveley Road and Upminster, the elderly and many residents of Aveley Road relied on the service to get to Lakeside or Upminster, however the Mayor of London decided not to implement an alternative replacement service. Although it was argued that the three other cross-boundary links to Thurrock were going to remain, this just shows how much local Havering residents rely on public transportation and especially in the case of this route as Aveley Road has no pavements to walk on so getting to Upminster or Thurrock without private transportation is impossible. https://www.london.gov.uk/who-we-are/what-london-assembly-does/questions-mayor/find-an-answer/373-bus-route-0/ http://mjcarchive.www.idnet.com/times/List_of_timetables_350_to_399.htm#373/ http://mjcarchive.www.idnet.com/times/350to399/373-Thurrock%2020051126%206440.pdf I am now going to focus on other districts of the borough as Upminster and Cranham are not the only districts within Havering that have suffered with poor public transportation.
8/10/24	I have begun writing in my EPQ about how I am going to carry out my activities throughout the project and have decided to use my skills of abstraction and decomposition in my project. I have decided to use abstraction to remove unnecessary details in my digital design maps to remove unwanted scenery and street names. Meanwhile, I have decided to use decomposition in my project to break each district of Havering down into smaller areas which are suffering with local transport as this will help me base specific locations where the photographs should be taken. I will create these photographs to show just how much residents are suffering without adequate transportation, and I will create these digital design maps to show how these areas could be improved with bus services or train services or any other services I may have researched and included in my designs. I am now going to focus on how I am going to plan on writing about said photographs and digital design maps and how I am going to conclude and evaluate the project with a PowerPoint presentation.
11/10/24	I have found out how to reference research and use the catalogue to find information for my research using Google Scholar as well as using EBSCO. I have also began writing about how I will present my activities towards the end of the EPQ course when I must present on the week of the 31st of March 2025. These new sources on Google Scholar will help me be able to use academic sources in my research to ensure that they are related to my project.
15/10/24	I have now finished my project proposal form, and I am now going to submit my project proposal form onto the VLE for my teacher to give feedback to. I have also begun to think about how I will present my research, and I am planning to use PowerPoint as it would be easier for me to understand. I am now going to focus on ideas of how to present my research as well as what research materials I will require.
18/10/24	I have just started my research portfolio today and have begun gathering my primary and secondary sources together to show I have conducted adequate research into my research. I have already uploaded my project proposal form onto the VLE and am awaiting feedback regarding my project proposal form. I have found out today about what was supposed to be a proposal for the East London Transit system in the form of trolleybuses running as far from Ilford, Harold Hill, and Collier Row to Rainham and North Greenwich. http://www.tbus.org.uk/eastlondon.pdf/ http://www.tbus.org.uk/project.htm I am now going to focus on ensuring I also have primary sources of information regarding a lack of transportation across the borough of Havering alongside looking at what were supposed to be proposed artefacts of the transportation network in Havering and how I want to improve upon these.

22/10/24	I have found out today about a proposal in 2023 by Ray Morgon, the leader of Havering Council, to introduce a link across the Northern-Southern districts of Havering in the possible form of a tramway, light rail, bus, or "monorail". It was estimated to cost "almost £200,000" to complete but would link Harold Hill/Collier Row to Rainham/Beam Park via Romford and Emerson Park or Upminster. I have made my existing artefact list into a table and have decided to list a few with names in one section and the reasons in the other section. I am now going to focus on finding more newer research as well as using EBSCO to back up my claims regarding previous artefacts that were developed and how I can improve on them. This will ensure that my research portfolio has as much relevant research as possible.
5/11/24	I have begun working on the final version of my Project Proposal Form which will be submitted on the 15th of November 2024. I have found more research during the half term regarding the decline of transportation in Havering and how these will affect residents in Havering. I am now going to focus on completing my final project proposal form and finding primary sources that I could use in my EPQ research.
8/11/24	I have found out today about Beam Park Station, which is a proposed station in Beam Park in Havering. Originally proposed in 2002 as one of two stations by the London Borough of Barking and Dagenham, it was taken over by Havering Council which considered the station of upmost importance as residents living in Beam Park had limited transportation access to the rest of Havering. In 2019, the station was given permission to be planned but as of July 2024 the station has been deemed unable to open to passengers due to the Department for Transport. https://democracy.havering.gov.uk/documents/s9135/01-58.pdf/ https://www.ianvisits.co.uk/articles/more-delays-for-beam-park-station-no-decision-until-later-this-year-71037/ I have also concluded regarding my final artefact I will produce which will be digital design maps for Havering and I have found out how EPQ can affect my careers. I am now going to focus on submitting my final proposal form and completing my research.
12/11/24	I have been getting my Project Proposal Form ready for final submission on the 15th of November 2024 by ensuring that I have checked everything thoroughly and ensuring that all information in my feedback was filled in and corrected from the first draft. I have extended my research deadline as I believe if I have more time to research my ideas, a better result will come out of it. I am now going to focus on submitting my final proposal form for the last time based on the feedback.
15/11/24	I have now submitted my final proposal form for the last time and am now getting ready to research different mapping and painting programs I can use as well as historical documents and sources in my research. I have also decided to steer away from photographs and decided instead to focus on digital design maps because I thought that they would be more impactful to a community. I am now going to focus on completing my research to the highest quality.
19/11/2024	I have begun my research fully today and have researched the advantages and disadvantages of bus routes as one of my viable solutions for my final artefact. It was written by a professional in the transportation industry for buses and had her full name in there along with the date it was written on. I am now going to focus on finding out about the advantages and disadvantages of trams, trolleybuses, and trains.
22/11/2024	I have found out information regarding trolleybuses and trains and the advantages and disadvantages of them. I also noticed that when I put the trains article into an AI detector it returned 55.16% AI generated as I noticed that there was no author nor no contact information or proof that a human would show. I plan to finish my research by the 20th of December 2024. I am now going to focus on finding out about trams.
26/11/2024	I have found out research today about the advantages and disadvantages of the implementation of trams and about Route 497 and the proposals that were supposed to occur on this route with Routes 346 and 347. I am now going to focus on continuing my research ready for December 20, 2024.
29/11/2024	Today I have found out more about Routes 346, 347 and 497 and the proposal that happened about them which I have written in my research. Here is what my summary looks like: “Transport for London announced a proposal on March 6, 2023, to tweak three bus routes in the London Borough of Havering. These were Routes 346, 347 and 497. Before the proposal was

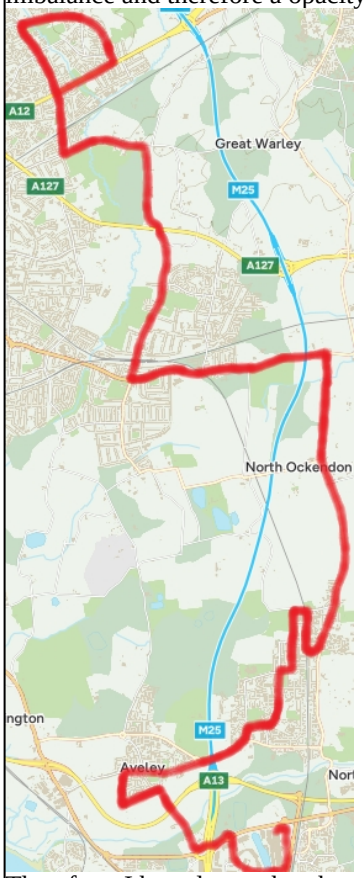
	announced, Route 346 operated as a single-decker service, Mondays to Saturdays only, between Upminster Station and Upminster Park Estate via Cranham, making it one of the shortest routes within not only Havering but across the entirety of Greater London. Route 347 operated between Romford Station and Ockendon Station via Gallows Corner, Harold Wood, Upminster, Cranham and North Ockendon, Mondays to Saturdays only and only 4 times a day, and connected many vulnerable residents within the London borough to the nearby shopping centres and schools of the area. It is also known as the least frequent bus route in the entirety of Greater London, surpassing Routes 389 and 399 which used to be the least frequent. Route 497 had only started three years before the proposal as a Hail and Ride service between Harold Wood Station and Harold Hill. Transport for London originally wanted to withdraw both Routes 346 and 347 and replace this by an extended Route 497 from Harold Hill to Upminster Station via Upminster Park Estate and Cranham before going round on St Mary's Lane back to Upminster Station. This was criticized however because this new route would have gone on a 15 minute detour approaching Upminster Station for no reason and residents argued it would stop serving roads that required a London bus service as they would be removed if the detour happened (e.g. Moor Lane in Cranham on Route 346 as a hail and ride road, which the proposed Route 497 would not serve as it would go via Front Lane entirely). While Transport for London argued that residents have access to the 248 in these areas, residents criticized this statement as some residents who live in Cranham don't live nearby to a bus stop that is served by the 248 and so may have to walk at least half a mile which would be a problem for those who are less able to walk, elderly or are disabled, which Route 346 was introduced to solve. As well as this, the removal of Route 347 would have meant that Clay Tye Road in North Ockendon and Cathedrals Estate in Cranham would no longer have access to a London bus service, with Cathedrals Estate not having a bus service at all. While TfL argued that residents in North Ockendon and Clay Tye Road could use Essex operated Route 269 before changing to Route 370 for Romford and Upminster, residents argued that this route had longer timetable gaps and only takes you to Brentwood and Grays unless you get off in either South Ockendon or North Stifford and even then Route 269 doesn't accept Oyster cards or Freedom Passes so it would cost more to have to get on this route every day. As for Cathedrals Estate, residents heavily criticized TfL actions saying that residents would have to walk 600 metres to the nearest bus stop through an alley with a pedestrian only connection and currently no lighting, which could be a struggle for those less able to walk or the disabled. Also, on part of the road on St Mary's Lane there is also no pavement so residents who live at Franks Cottages cannot walk to the bus stop even if they wanted to." Now I am going to focus on other districts in Havering including Rainham, Hornchurch and Hacton.
3/12/24	I have found out research today about Route 373 which operated in Upminster and Corbets Tey between 1987 and 2008 (from my previous research and resources I have used) and have written up about this route as it marks a significant isolation of Havering residents after being removed. I have also written about the Liberty line in Romford which was a rebranding of the Romford to Upminster line and a waste of money. I am now going to focus on Hornchurch, Rainham, Hacton, Harold Hill, Wennington, and Havering-Atte-Bower.
6/12/24	I wrote up today about the Thames Weald service and have found an academic article about the original creator of the service and why he changed positions of being a psychiatrist to a bus route maker. I also experimented with different map and painting programs to see which one would be the best for my digital design maps and I have decided the map will use the Ordnance Survey map as it has more advantages than disadvantages. I have also been experimenting with Adobe Photoshop and have found that it is not very user-friendly and is expensive so am also looking at other paint programs for my digital design maps. I am now going to focus on finding other painting programs that I can use to make my digital design maps.
10/12/24	I found out some facts and statistics regarding how many services are operated in Havering and proceeded to compare these to the local London boroughs of Barking and Dagenham and Redbridge and made a comparison using reliable information from the TfL website, although some was unreliable as it had not been updated in some time. I am on schedule with my research time and believe I should be able to complete my research on 20th December 2024. I have also begun researching different painting programs and will continue to do so and then write these onto my research. I am now going to focus on finishing my research by December 20, 2024.
13/12/2024	Today I found out about Route 347 being withdrawn as of January 18 2025, even with strong objections, and they were continue to argue that it is a waste of money in this area and that Essex Route 269 connects residents still and that Route 346 now covers most of Route 347 so there is no reason for Route 347 to exist, and the frequency on Route 370 was increased to ensure that residents could still be connected. I am now going to focus on finishing my research by next Friday.
17/12/2024	Today I found about previous artefacts that have existed as a "user-friendly" proposal for certain routes within the London Borough of Havering and I proceeded to write about the advantages and

	disadvantages of each of these. I am on track and have three days to go before I will finally submit my research portfolio. I am going to focus on testing pieces of software for painting and finishing my research on Friday.
7/1/2025	I have begun my Skill Development and Producing an Artefact today after finishing my research in December 2024 and have started my portfolio by justifying the reasons why I chose to use resources (Windows computer, Microsoft Paint 3D, Ordnance Survey Map). I was fully justifying my reasons why to ensure that there were cons to each software but overall, it was better to use compared to my other ideas. I am going to now focus on my skill development and justifying the town I will base my artefact on.
10/1/2025	Today I wrote about the area in Havering of which I was going to base my artefact and have begun carrying out my decomposition and abstraction that I put in my project proposal form. I have decided on using Clay Tye Road and Cathedral's Estate in Cranham which are recent occurring's of an area where residents feel isolated due to a lack of public transportation due to the constant threat that Route 347 will be withdrawn. I have decided my digital design map will be a bus route because trolleybuses and trams are extremely expensive compared to bus routes and harder to implement due to re-routings, and because train services to Cranham/North Ockendon via the District Line, London Overground or c2c would be too expensive as it would require the construction of a new branch of the c2c railway line and for the London Underground and London Overground it would involve the demolition of the Upminster train garage where District line trains are stored. I am now going to focus on making some designs.
16/1/25	Today I created my first design of one my digital design maps, and I decided to base it on Route 348, as this route served Cranham, which I made previous research on my website. I altered the route slightly by making it run via Rush Green and after Ockendon Station making it run via Belhus, Aveley and Lakeside Retail Park to Lakeside Shopping Centre.  I decided to first try the oil brush on Paint 3D to make the digital design map but decided that would not work for the final design because the minimum thickness was 10px (10 pixels), which would result in excessive painting for my final design if it had small lines that need to be painted. As well as this, the oil brush option also has a very low opacity which results in only the middle part of the paint line being prominent, which in turn creates a colour imbalance.

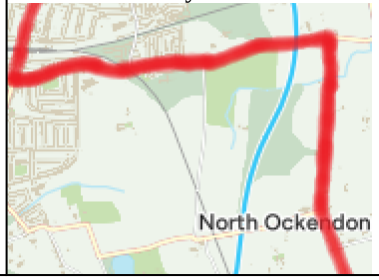
	 As a result for this, I have learnt that the oil brush tool only works well if you want a realistic painting but not very well for digital design maps as the low opacity and minimum thickness could result in my digital design map being considered inaccurate and not very abstract. I will now being focusing on creating more designs that test out all the different painting options that Paint 3D has to offer and then I will settle on a final one for my artefact. 
17/1/25	I have decided for my next design to perhaps try out the spray paint function on Paint 3D as the spray paint function has both a thickness and opacity adjustment so that way unlike the oil paint tool it will perhaps work well at creating my second design. I will now focus on my second design.
21/1/25	I have decided I will be extending my deadline for my Skill Development and Milestone Two from January 20th 2025 to February 15th 2025, giving me an extra 25 days, as I underestimated how long it would take me to complete my Skill Development in the beginning. I've also decided therefore to extend my creation of my final design from February 15th 2025 to March 4th 2025 so that I also get more time on developing my final design before I decide to annotate it. I will now focus on creating my designs and finishing my Skill Development by the 15th of February 2025.
23/1/25	Today I created my second design of one of my digital design maps and decided to draw the route freehand on paper first before creating it on Paint 3D using map software. I decided to use Route 347 as inspiration and slightly altered the route so that instead of going to Romford it went to Harold Hill and instead of going to Ockendon it went to Lakeside instead. I decided to also use some inspiration from the first design and annotated major roads the route would serve and nearby routes and roads that are important to the route. 

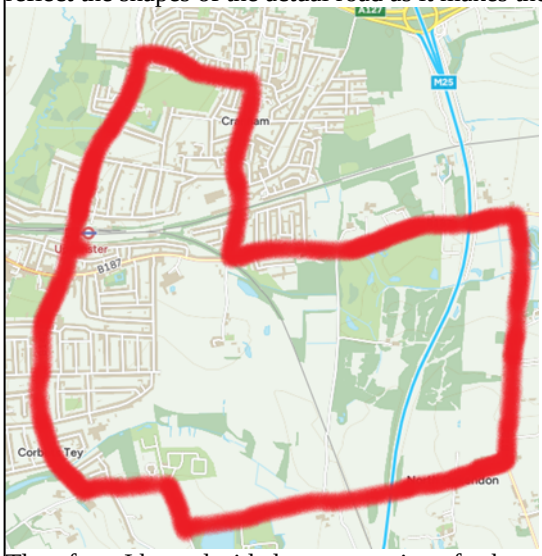


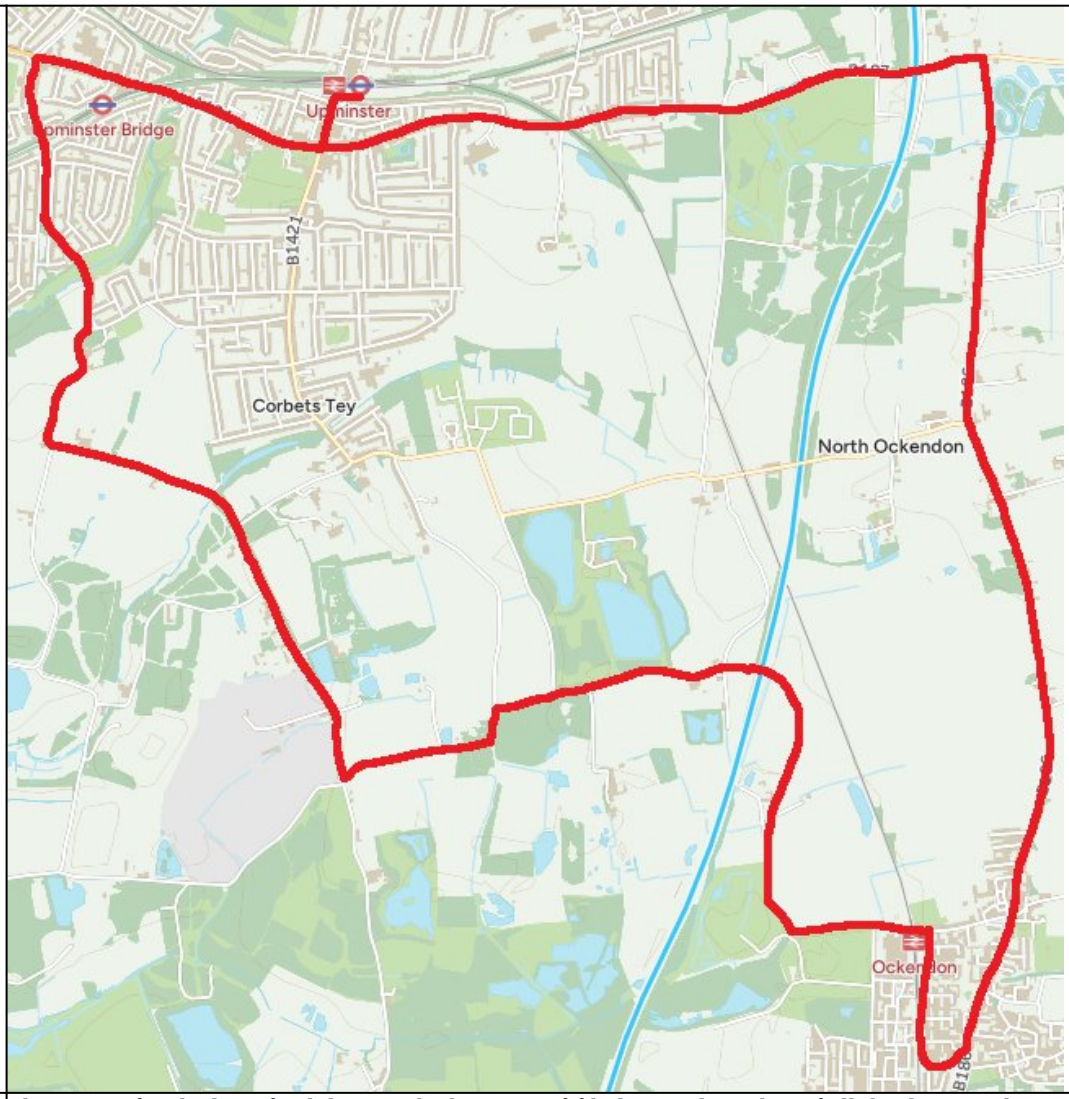
I decided instead of using spray paint for this design I would use the watercolour tool on Paint 3D however like the oil brush tool I decided this will not work for my final design because although the thickness can be decreased as far down as 5px unlike the oil brush tool, the opacity was still off as I could tell that parts of the paint were faded while others were stronger which created a colour imbalance and therefore a opacity imbalance.



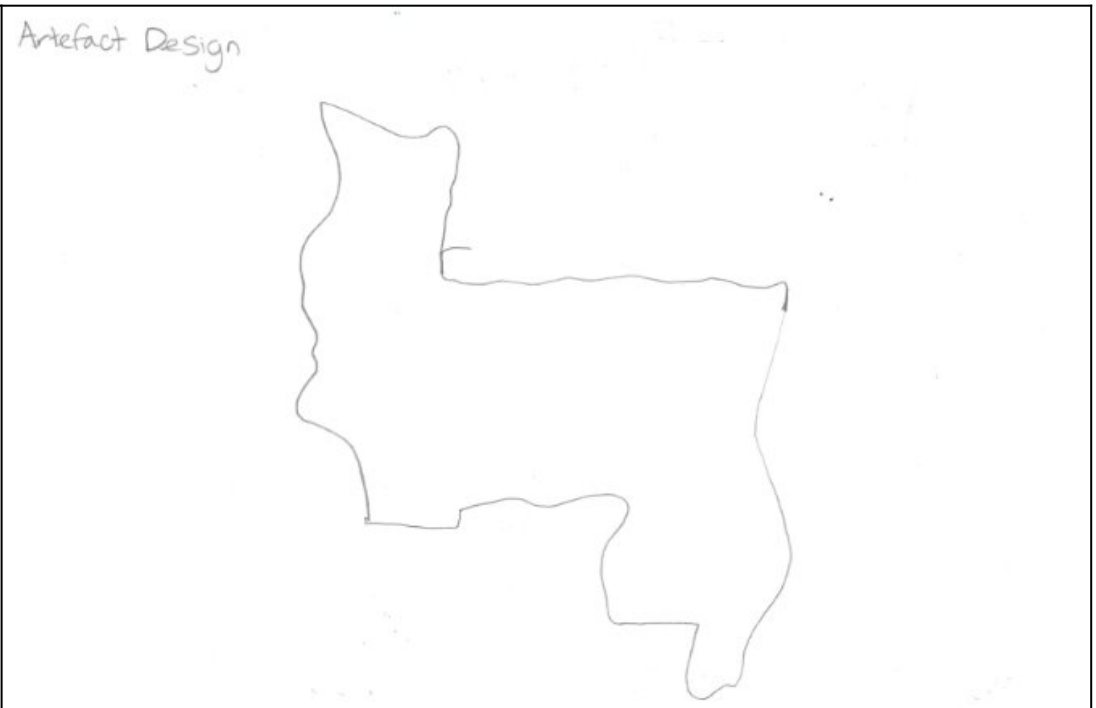
Therefore, I have learnt that the watercolour tool only works well if you want a very realistic drawing similar to the oil brush tool however it can have a lower thickness compared to the oil brush tool but this wouldn't work for my digital design map because my map could be considered inaccurate and also non-abstract and therefore I will not be using this tool for my final design. I will focus on creating more designs that test out the different painting options in Paint 3D and from there decide on a final one for my artefact.

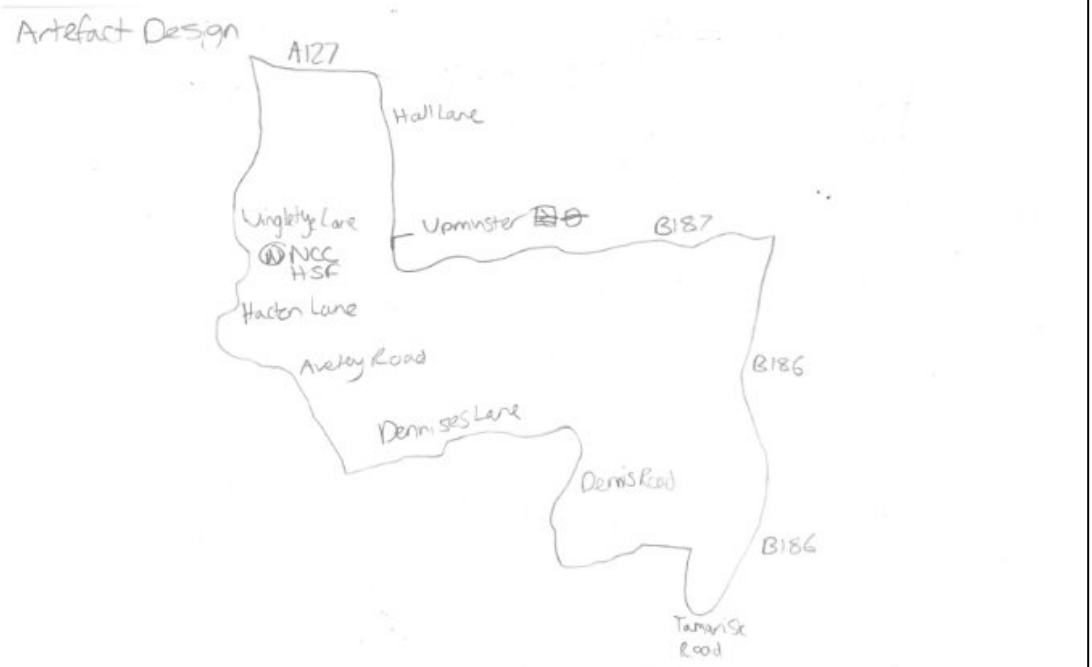


24/1/25	I have decided for my third design I will be using the spray paint tool that I did not use in my second design, and I will ensure I keep creating more designs that test out the different painting options in Paint 3D and from that decide on a final one for my artefact. I will now focus on finishing my skill development by the 15th of February.
28/1/25	Today I have drawn my third and fourth designs for my skill development. For my third design using paper, I decided to use transverse waves as an inspiration because they reflect some of the roads within Upminster and Cranham however decided to not use them in the end because they don't accurately represent the roads of these areas and also the lines are too curly which results in roads looking like they directly connect with each other when they do not or makes roads look very bendy. For my fourth design, I took inspiration from my third design however terminated the route at Upminster Station instead of a full-on loop like design three and decided that this may possibly work well for one of my final designs. I am now going to complete the Paint 3D versions of these designs and then evaluate more on how they went and focus on finishing my skill development.
30/1/25	I have finished my slide for my third design and decided to use the spray can tool like I said I would earlier in my activity log. However, I noticed some issues with using this to create the Paint 3D design. First of all, the thickness can't be set lower than 25px which results in accuracy errors, which I saw especially while drawing Upminster Station. Secondly, there is also parts of the spray paint which does not represent parts of the roads which makes my map seem inaccurate as it doesn't truly reflect the shapes of the actual road as it makes them appear bigger.  Therefore, I have decided to not continue further with the spray can tool when producing my final artefact and will continue to make more designs to find the tool that is right for me.
31/1/25	I have finished my slide for my fourth design and decided to use the pixel pen tool and am planning on possibly using this tool for my final artefact. This is because the thickness of the Pixel pen can be decreased to as low as 1px while other tools I used couldn't go lower than 10px or 25px. As well as this, the Pixel pen has great opacity as it has no colour imbalance or only prominent paint in only part of the design. The only issue I could find with the pixel pen was that when zoomed in it was pixelated but that is to be expected from a Pixel pen. I am currently finishing the slide for my final design and from there will go on to making my final artefact after deciding on the best tool and design.

	
3/2/25	I have now finished my final design which was my fifth design altogether of all the designs I have made. From this, I have been able to successfully determine which tool will work best for me when producing my final artefact and this would be either the marker or pixel pen tool out of the five options. I now must consider out of the five designs which design I would like to use for my final artefact. For my fifth design, I used the marker tool in Paint 3D which is a really good tool just like the pixel pen and has no colour imbalance nor opacity imbalance and allows me to reduce the thickness to 1px. However, unlike the pixel pen, the marker has a very great bit quality which results in a higher-quality image. I also did not encounter any disadvantages when using this tool.

	 I will now be focusing on creating my final artefact and deciding which design I would like to use for my final artefact.
4/2/25	After being given feedback about my research portfolio, I have updated my research to include more facts about Havering and who operates all the services within Havering as well as updating my statistics with inspiration from the feedback I was given. I have also decided on using the marker tool on Paint 3D and inspiration from my fourth design to create my final artefact, and as my college does not currently have access to Paint 3D as I have been doing this from home, my teacher has emailed the IT department of my college to find out whether or not Paint 3D can be allowed for me to be installed so that I can use it to create my final artefact. I have therefore now finished my skill development and wrote a conclusion about it. I will now be focusing on creating my final artefact by March 4th, 2025.
6/2/25	I have been alerted by my IT department at my college that unfortunately they are unable to provide access to Microsoft Paint 3D because Microsoft no longer supports the software and are requesting if there is an alternative software that I can use for my designs and this in turn puts me at a disadvantage compared to most other people but however I have access to Paint 3D at home on my PC and laptops which could possibly be a solution for my issue by perhaps bringing that along to EPQ. If I was to change from Paint 3D to Adobe Photoshop which was recommended by IT, like I concluded in my research, there would be several issues with this, mainly being that Adobe Photoshop is not user friendly and doesn't support vector graphics unlike Paint 3D which makes images more pixelated. I will now be focusing on creating my final artefact's design before creating the final artefact by March 4th, 2025, while at the same time making improvements to my research portfolio when necessary.
7/2/25	Today I have created the design for my final artefact that I will be making on Paint 3D at home due to the lack of access at my college and so therefore my teacher has said that I am allowed access during my EPQ sessions to go home and access the software whenever neccessary to complete my artefact.

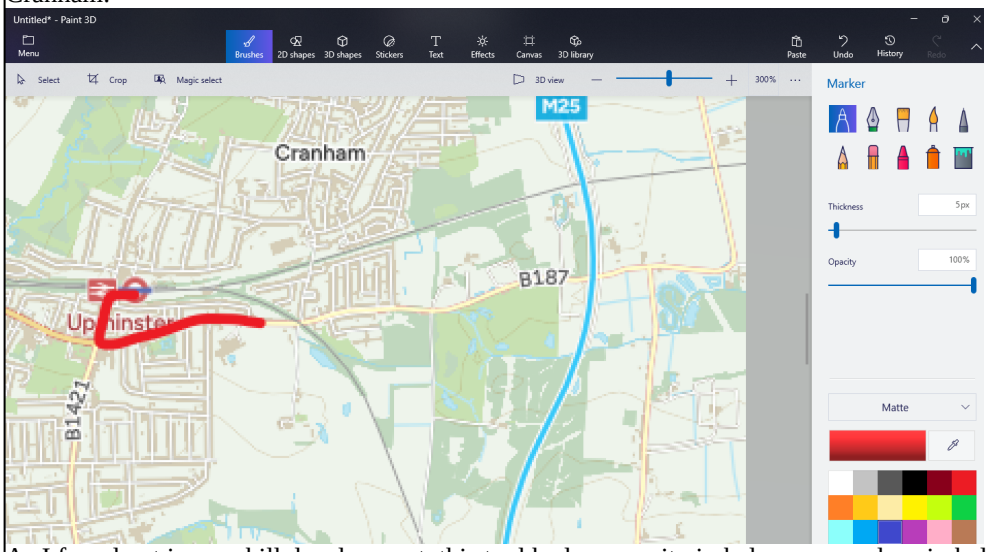
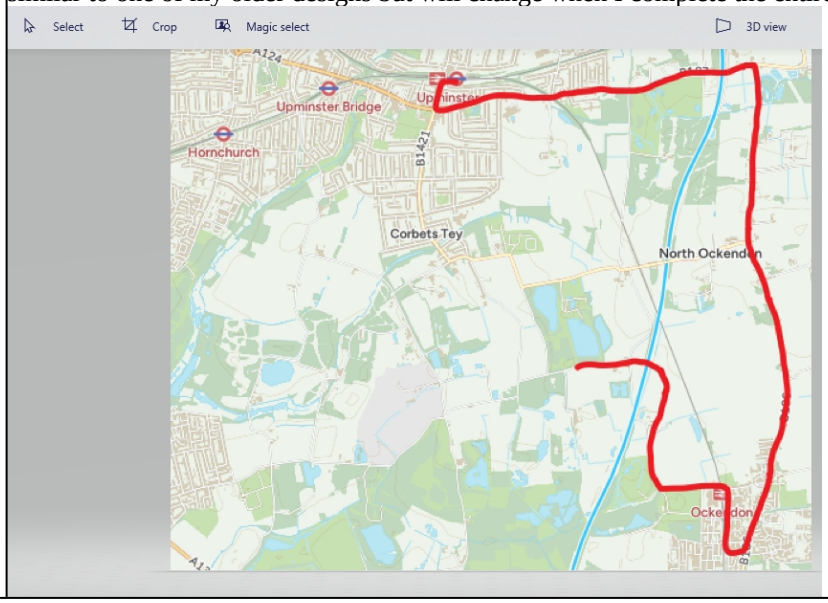




For my artefact design, I got inspiration from my fourth design as it almost looked like a triangle and I slightly changed the design so that instead of going to Upminster Bridge then to Upminster, it would go to Emerson Park instead. I was also inspired my third, fourth and fifth designs to create a paper design first, one with annotations and one without annotations. I would say my design looks a lot like a rectangle compared to my fourth design which looked more like a triangle.

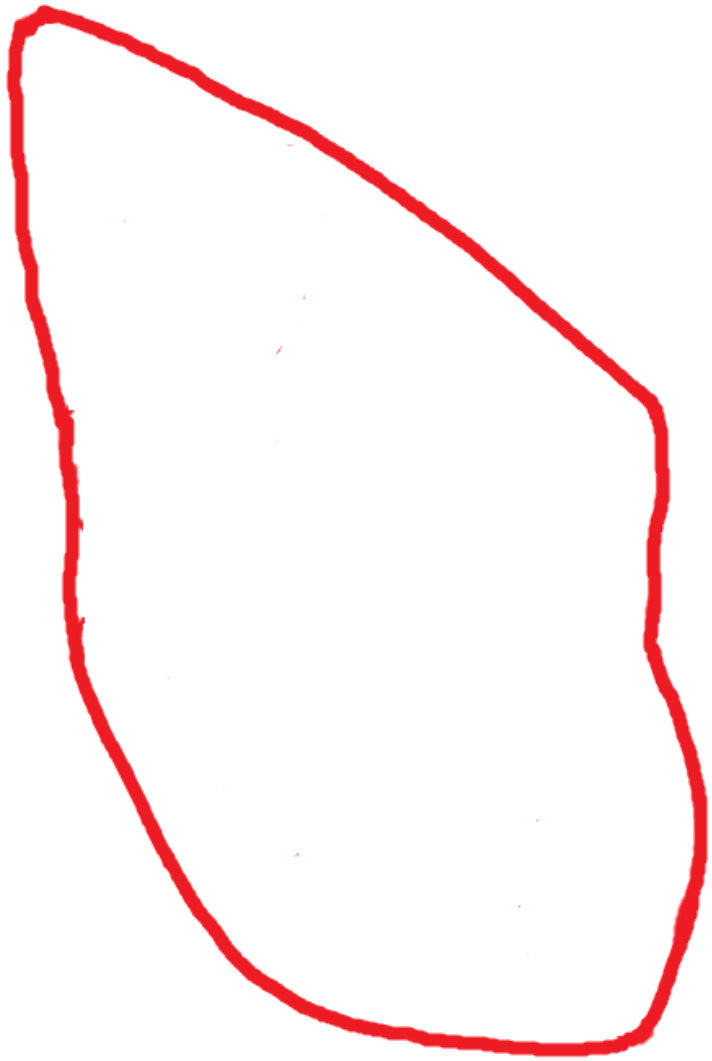
I have also updated my research to say that I will be producing a geographical abstract digital design map as my maps are geographical inspired and I also proceeded to look back at my mood board and write about the positives and negatives regarding each of the designs, with the main positives being that they are mostly abstract and user friendly to people who understand the map while the negatives are that some still feature non-abstract locations, it could be harder to understand without a key (which is what my annotations on my artefact will be) and some of the designs also do not show geographically what the area looks like in real life.

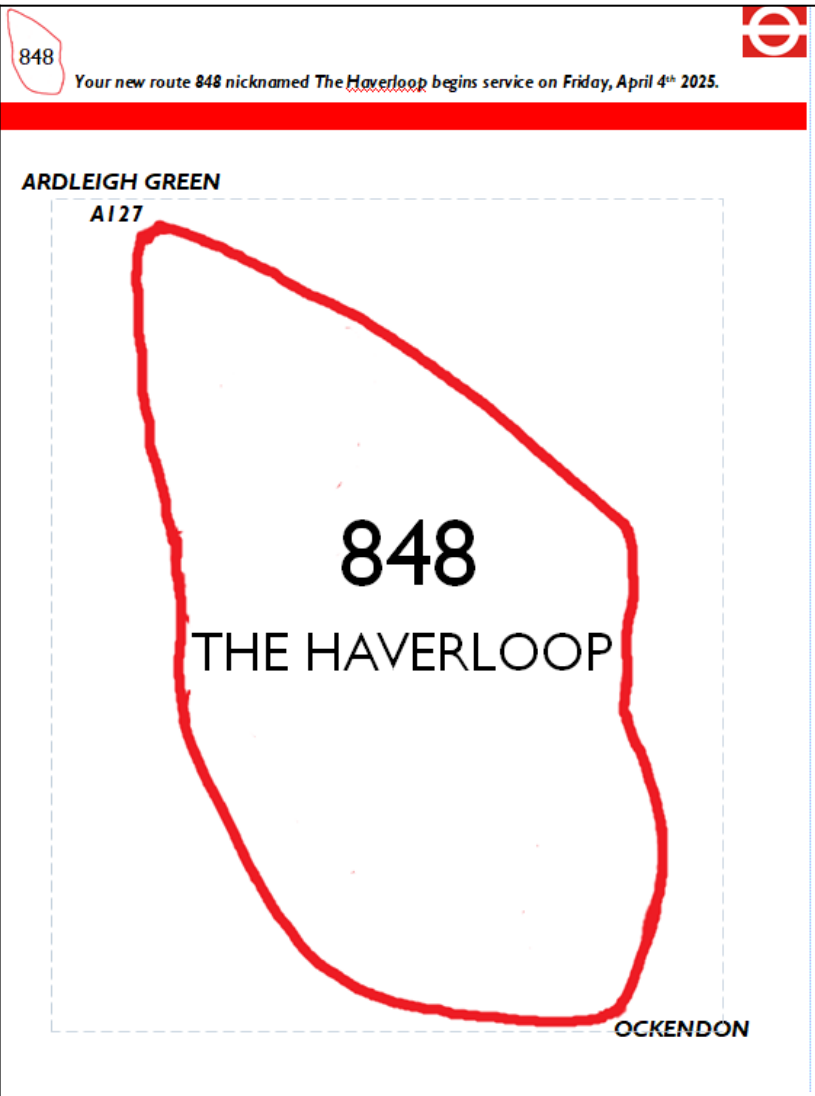
I will now be focusing on developing my artefact and producing the final design using Paint 3D by March 4th, 2025.

8/2/25	Today I started by starting my final artefact by setting the tool I was using to the Marker tool and setting the opacity to 100% and the thickness to 5px in Paint 3D. I then took a screenshot of the area of map I needed in the Ordnance Survey map and begin drawing the first line between Upminster and Cranham.  As I found out in my skill development, this tool had no opacity imbalance, no colour imbalance and was able to go lower than 10px in size which made it the perfect tool to use. I made sure to save this file so I could continue working on it as I go along finishing my artefact. I will now be focusing on producing my artefact using Paint 3D by March 4, 2025.
11/2/25	Today I updated my research portfolio and was talking about where my geographical abstract digital design map would be used and I said that it would most likely be used on leaflets and websites as well as possibly local transportation services to make people aware that they are not truly isolated and that these designs could possibly become final designs for actual routes that could be introduced by Transport for London to support the London Borough of Havering. As I still have no access to Paint 3D, I will be working on my final artefact at home outside of EPQ lessons or at home working remotely in EPQ lessons. I will now be focusing on producing my final artefact using Paint 3D by March 4, 2025.
14/2/25	Today I updated my research portfolio and added a mention in my what I'm planning to produce slide to mention that I wanted to link back to Slide 4 which was my newest slide where I said what I was going to use my digital design map for and how it would be used. I also looked at my skill development to check that it specified all the points that I wanted it to have on there. As half term is approaching as of today for a week, I feel mostly ready for the presentation in April. My teacher told me today that we will talking about the presentation when we come back after half term, and I believe overall I am ready to start thinking about what I am going to be presenting and how I'm going to present. I will now be focusing on producing my final artefact using Paint 3D by March 4, 2025 as well as planning for my presentation. I have also now reached mid development of my artefact and right now my artefact currently looks like this and I believe it is coming along well and that through my skill development I was able to make the right choice with what tools I should have used and the opacity as well, right now it looks similar to one of my older designs but will change when I complete the entire artefact. 

25/2/25	Today my teacher talked to us about the presentation and about how we should meet the specification when doing our presentations and gave out some handouts for us to look at regarding the presentation and told us that we have to ensure that we time our presentation correctly and do not go into too much detail to the point that it goes over 10 minutes long. I have almost now finished my final artefact, and it should be ready before March 4, 2025 which gives me enough time to think about the presentation that is happening on April 4, 2025. I will now be focusing on finishing my artefact and planning my presentation for April 4, 2025.
27/2/25	Today I have finished my final artefact without its annotations, and I also updated my research portfolio today. I mentioned how I wanted to annotate my design after creating my final artefact to allow people to understand it and I researched the three main annotation software's, those being: Microsoft Word, Microsoft PowerPoint and Microsoft Publisher. Overall, I decided on using Microsoft Publisher because it provides a variety of templates that can be used alongside design tools alongside an easy-to-understand user interface which is easy to learn and use in most everyday tasks. Microsoft Publisher also allows text and image integration, and its files can be saved into many formats or printed alongside offering excellent data visualization. Here is what my unannotated final artefact currently looks like:

28/2/2025	Today I started by first off creating a new publisher file in Microsoft Publisher and I decided to make my design more abstract by first removing the background for my artefact using Microsoft PowerPoint and straightening out the lines to make sort of an oval shape.

	 I then proceeded to design the first page of my publisher project by adding the now oval-like abstract design to the first page and coming up with a catchphrase for my artefact, and I decided on the Haverloop as I was inspired by the Superloop as a new route is supposed to be coming to Havering very soon numbered SL12 between Gants Hill and Rainham. I then decided on a route number for my artefact, and I decided on 848 because the number 8 reminds me of two loops happening at once which is what the digital design map clearly shows.



Here is currently what the first page of my publisher annotations looks like, making it very abstract by just saying when the new route starts at the top and in the middle a giant route number and the nickname alongside the main two terminuses.
I then added the final artefact design on the second page and proceeded to list the main roads that the new route would serve to keep my artefact abstract as well as keep the original little logo I designed for it for the second page.

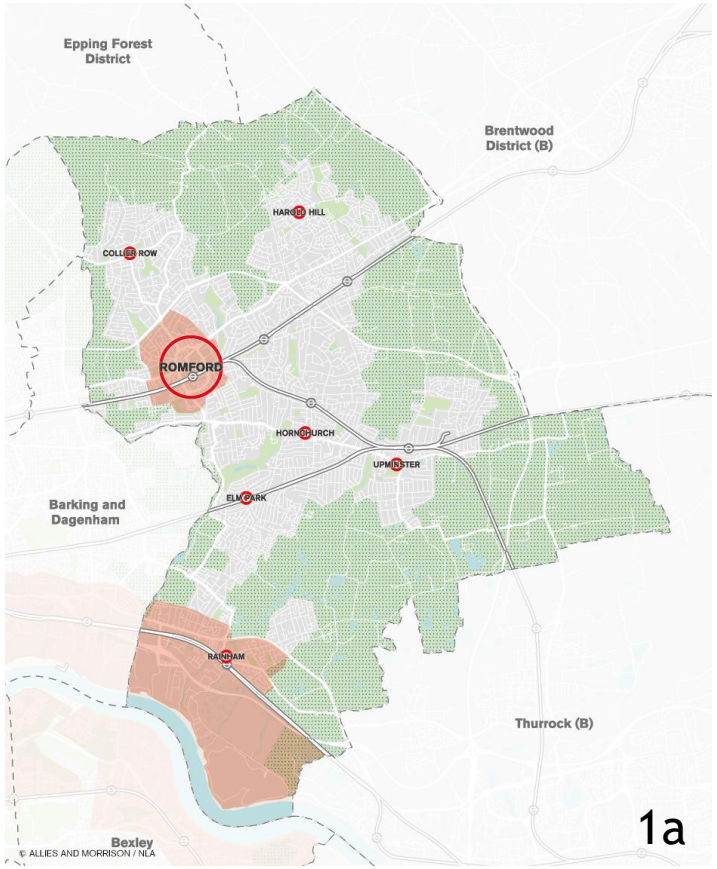
	848 **Where it goes** I will now be focusing on my presentation which I will have to do on April 4th 2025.
4/3/2025	Today I made a timetable for my final artefact about the times of which this new route would stop at its locations throughout its journey, including a Monday to Saturday service and a Sunday and Bank Holiday service. Here is what my timetable looks like:

	848 ***Your new timetable*** **848** Ardleigh Green - Upminster - Ockendon - Hacton - Ardleigh Green Monday to Saturday Ardleigh Green *Redden Court Road* 0700 0815 0930 1115 1310 1509 1705 1810 2030 Upminster *Hall Lane* 0708 0823 0938 1123 1318 1517 1713 1818 2038 Upminster Station 0713 0828 0943 1128 1323 1522 1718 1823 2043 North Ockendon *White Horse* 0723 0838 0953 1138 1333 1532 1728 1833 2053 Ockendon Station 0728 0843 0958 1143 1338 1537 1733 1838 2058 Aveley Road *White Post Wood* 0736 0851 1006 1151 1346 1543 1741 1846 2106 Hornchurch *Hacton Lane Estate* 0741 0856 1011 1156 1351 1548 1746 1851 2111 New City College *Havering Sixth Form* 0743 0858 1013 1158 1353 1550 1748 1853 2113 Southend Arterial Road 0752 0907 1022 1207 1402 1559 1757 1902 2121 Ardleigh Green *Ardleigh Green Road* 0753 0908 1023 1208 1403 1600 1758 1903 2122 Ardleigh Green *Redden Court Road* 0755 0910 1025 1210 1405 1602 1800 1905 2124 **848** Ardleigh Green - Upminster - Ockendon - Hacton - Ardleigh Green Sundays and Bank Holidays Ardleigh Green *Redden Court Road* 0930 1115 1310 1509 1705 1810 Upminster *Hall Lane* 0938 1123 1318 1517 1713 1818 Upminster Station 0943 1128 1323 1522 1718 1823 North Ockendon *White Horse* 0953 1138 1333 1532 1728 1833 Ockendon Station 0958 1143 1338 1537 1733 1838 Aveley Road *White Post Wood* 1006 1151 1346 1543 1741 1846 Hornchurch *Hacton Lane Estate* 1011 1156 1351 1548 1746 1851 New City College *Havering Sixth Form* 1013 1158 1353 1550 1748 1853 Southend Arterial Road 1022 1207 1402 1559 1757 1902 Ardleigh Green *Ardleigh Green Road* 1023 1208 1403 1600 1758 1903 Ardleigh Green *Redden Court Road* 1025 1210 1405 1602 1800 1905 This has allowed me to practise my skills of decomposition like I said I was going to do in my project proposal form as it has allowed me to identify key locations within these areas I will be serving that do not have access to a bus service (Aveley Road, Redden Court Road and Hacton Lane Estate) currently or have a very poor service (Ockendon Station for example on NIBS buses route 269 only since Route 347 was withdrawn)
7/3/2025	Today I have been planning for my final presentation for the 4th of April 2025. I was writing so far about the extent to which I had achieved what I wanted to achieve in my Extended Project, alongside a summary about my artefact and what it is. Mock week is coming up next week and I am planning on possibly writing up more during mock week alongside resting and preparing for my mock exams. I will now be focusing on finishing my planning for my presentation.
17/3/2025	Today I have thought more about my presentation plan and for the section about "How well my artefact meets my original brief", I linked back to my original project proposal form regarding abstraction and decomposition, which are two main parts of A Level Computer Science. I explained how I was able to implement both into my artefact. Mock week was quite tiring, but I was having some thoughts about my EPQ even during this week and thinking about how I could show my presentation. I will now be focusing on finishing the planning for my presentation before planning how I will show my presentation.
18/3/2025	I have created a survey to find out whether people in my sixth form feel isolated in terms of public transportation in Havering as this can back up my evidence for my research and be presentable in my presentation as a way of showing evidence. I have gotten further with planning my presentation by writing more about how I met my goals. I will now be focusing on finishing my planning for the presentation.
21/3/25	We are now two weeks away from the presentation and I have gotten results back from First Year on a survey which I created on Tuesday and in total got 158 responses. I have begun analysing the results from which I have gotten from the survey, and I asked my teacher if he could send the Microsoft Forms link to second year students, so I collect more results regarding them. I also began talking about how well I managed during the project, and I said that overall, I believe I was able to manage the project well even with a few difficulties like extending my deadlines or losing focus while being a project manager but overall believing I came out successful. I will now be focusing on the presentation in 2 weeks time.

24/3/2025	Today I have thought more about my presentation plan and how I felt overall regarding the EPQ and how successful I was as a project manager and am now going to be creating a PowerPoint presentation to be displaying my artefact and thoughts about the EPQ that I did on. We are on the countdown now till the 4th of April and getting ready to present the presentation and will be doing a trial run soon. I will now be focusing on the presentation in 2 weeks time.
25/3/2025	Today I have created my presentation for my EPQ and have begun rehearsing it in preparation for next week Friday. I honestly do feel quite nervous about the presentation but have assured myself that I will be okay during the presentation. I also looked at the January 2025 grade boundaries for the EPQ and also the January 2024 examiner feedback to see how I could meet the requirements given of me to get a high grade because these 9 marks can affect if you go from one grade to the next. I will now be focusing on performing the presentation.
28/3/2025	Today I have updated my presentation to talk more about the issues that I had during the project and how I solved them, alongside linking back to my project proposal form about how I met what I planned to set out for my project. I also updated my research by now talking about Questions 5, 6 and 7 and how students responded to those questions on my form. I feel ready for next Friday when the presentation is. I will now be focusing on rehearsing my presentation for Next Friday.
01/4/2025	Today I have wrote more in my presentation in preparation for Friday and ensuring I time my presentation to be at least 10 minutes. Friday is now the next focus as it is worth 9 marks. I will now be focusing on doing my presentation in 3 days time.
16/4/2025	Today I have been updating my research more and talking about how students responded to the questions on my form for Questions 8, 9 and 10 which were questions regarding what areas in Havering did they feel needed reforming to their transportation network, with Question 9 asking students to specifically identify one area where they believe a reform was necessary and Question 10 asking them to explain why they felt this way. I also successfully completed my presentation on the 4th of April 2025 and was able to present a presentation very clearly within 12 or so minutes. Considering how the EPQ is coming to the end on the 29th April I feel that overall I have developed my skills at being a project manager and producing an artefact and overall would do an EPQ again. I believe I was able to fully evaluate my artefact against the original brief while maintaining eye contact with my audience and I was able to successfully engage my audience with a few questions that I came up with. I was also able to successfully answer the questions asked to me and was confident, calm and clear with my answers where for example my teacher asked me whether residents would feel less isolated by the impact of my artefact displaying the main destinations and roads that my artefact would serve and I responded by saying that residents would feel less isolated as a result because they would have another service available where possibly they wouldn't at all and that my with my artefact through the use of abstraction I have been able to display the main roads that the artefact would serve. Also considering how EPQ Artefact is coming to an end, I am considering applying for the dissertation unit for second year upon reenrolment to my sixth form. I will now be focusing on submitting all my EPQ work including the project proposal form, project activity log, research portfolio and skill development and producing an artefact portfolio on Tuesday 29th April 2025.
22/4/2025	Today I have been looking over all my EPQ work as far as my research and have been thinking about areas to improve in preparation for next Tuesday. I have been ensuring that my project proposal form and my project activity log have the necessary candidate information on them alongside ensuring I had filled in logs that could have been partially missing such as in my research but other than that have been proofreading my work to ensure that my work makes sense and is understandable to an examiner. I will now be focusing on submitting all my EPQ work by 29th April.
25/4/2025	Today I have continued to look over my EPQ work and have changed the candidate information in the activity log and project proposal form as I realised the candidate number is used and not the Pearson registration number but I have also been looking over all my portfolios to ensure that everything that I say makes sense. I updated my Skill Development to be able to clearly show the images that I had used for my Third Design as prior to me updating the portfolio the images of my designs were smaller than expected. I proceeded to add annotations to my research portfolio to show what bits of my research that I had used in my designs and my artefact.

Do Havering residents feel isolated in terms of public transportation compared to other London boroughs and Essex?

EPQ Artefact - Research



1a

Introduction:

- I have decided to research the London Borough of Havering and some of the failures that have occurred during the rule of Transport for London (TfL) since 2000 when it replaced London Transport (1933-2000) as these are the reasons why residents feel increasingly isolated e.g. withdrawals/diversions as this is a part of my EPQ project and therefore I require research of these occurrences.
- I will researching the different modes of transportation depending on the advantages and disadvantages of each and how these can be good for the final artefact.
- I will be researching different map programs, different annotation software and different painting programs in order to be able to produce my artefact.

London Borough of Havering[1b, 1c, 1d, 1e, 1f]

- The London Borough of Havering is an East London borough which was originally considered Essex prior to 1965.[1g]
- As of recently, the population of Havering is 264,703 people.[1b]
- Nearly all transportation provided in the London Borough of Havering is operated by Transport for London (TfL) and has been since 2000 when it replaced London Transport.
- Transport for London operates four tube stations, three Elizabeth line and Overground stations, 870 bus stops of which there are 23 bus routes operated by TfL, 145 traffic signals and around 21km of red routes in Havering.[1c]
- However, there is a small section within Havering that is also operated by other operators, such as:
- c2c services at Rainham and Upminster.[1d]
- Greater Anglia services at Romford and Gidea Park.[1e]
- NIBSbuses Essex commerical route 269 in North Ockendon.[1f]

I have investigated the population of Havering, the companies that provide transportation in Havering to be able to link back to my question which was specifically about Havering's transportation.

What I am planning to produce:

I am going to produce a digital design map that is geographically abstract using possibly several computer-based paint software and map programs alongside annotation programs. I am going to use parts of the map program by taking screenshots and then edit this map using said paint program depending on each area on the borough.

I will need to find out the hardware resources I will require, and which software has the best visual look compared to the other and ones that are easier to navigate and understand.

I want it to be similar in style to the official TfL bus maps of the time prior to 2018 when the physical paper maps that showed what they looked like in real life were removed from circulation and never reintroduced.

My digital design map will be used to help residents in the local area understand that they are not truly isolated and there is a possibility that a route could be introduced for their local area. It would be used mainly on websites and leaflets but perhaps also advertised on local transport in the area.

Advantages and Disadvantages of Bus Routes[2]

Available from: https://heybus.com.ua/en/news/pros-and-cons-of-traveling-by-bus by Elena Chernenko.

Author:
Elena is a recognized expert in the bus transportation industry. She has earned a reputation for reliably working with both large carriers and her expertise includes route planning, safety analysis and efficiency of transportation solutions.

Reliability:
This article is reliable as she has based her article on her profession and not just on her experience and views. As it says in the author part of the page, she is a recognized expert and is qualified and knows how to reliably work with major companies when trying to plan transportation solutions. The fact that the website also has the specific date that it was written, as well as the author's surname makes it also easier to research whether she has any background in the transportation industry. However, this could also be considered unreliable as the article talks about her having a blog although it does not give a website link to this blog, which could make readers wonder whether Elena really exists or not.

Key notes from the article:

Advantages

- Saves money – less operational costs
- Routes can be flexible – can serve many locations within a short period of time
- Reduces congestion – fewer cars on the road

Disadvantages

- Trip length – often take longer than most other forms of transportation
- Road quality – roads may be in poor condition which can result in passenger discomfort
- Traffic jams – can cause delays and so therefore increase travel time
- Possibility of breakdowns – breakdowns can still occur with modern buses and so can cause delays and increase travel time

Overall, this research was useful as this was the main method of transportation that I utilised for my designs and my final artefact.

Advantages and Disadvantages of Trolleybuses[3]

Available from: https://www.tutorialspoint.com/what-is-a-trolleybus-advantages-and-disadvantages by Manish Kumar Saini

Author:
The author's name is Manish Kumar Saini and the author posts about things related to electricity and he has published a total of 1378 articles on this specific website.

Reliability:
This article is unreliable as although it tells the reader the author's name, it gives no additional data about the actual author, possibly making it a biased opinion as Manish could be considered unqualified, however upon further research through a Google search of his name reveals his LinkedIn profile where it says he is an Electrical Project Engineer. However, this still could make him not a professional in the trolleybus industry as his author profile is blank and it doesn't mention anything about any qualifications that he has done to support the fact that he is an expert in the industry. It also doesn't provide a direct link to any website that Manish is a part of on the website either.

Key notes from the article:

Advantages

- Better adhesion - the rubber tyres used in trolleybuses gives them better hill-climbing capability and braking.
- Trolleybuses are electric vehicles; hence they are environment friendly in cities.
- Trolleybuses can generate electricity from kinetic energy while braking which is known as regenerative braking.
- Trolleybuses are almost silent and do not cause noise pollution.
- A trolleybus can accommodate slightly more passengers than an oil engine bus.

Disadvantages

- Must slow down as they turn - Trolleybuses have unique operating characteristics.
- Re-routing of the trolleybuses are not usually readily available outside of the downtown areas.
- Cannot overtake one another unless two separate sets of wires with a switch are provided or the buses are equipped with off-wire capability.
- Expensive - cost of overhead equipment for a trolleybus service would be too large relative to the number of passengers carried and the revenue earned.

Although this was interesting research to discover about trains, I did not use this in my designs and my final artefact because I was focusing more on bus routes.

Advantages and Disadvantages of Trains[4]

Available from: https://www.kitalogistics.com/en/blog/rail-freight-advantages-and-disadvantages/

Author:
The author has not been listed on this article.

Reliability:
This article is unreliable as the reader doesn't know who wrote the article, so we can't tell if a human wrote it or not as it could be AI generated. I did some further research using a website called zerogpt.com and inputted the text into AI detector which then responded with an AI generation percentage of 55.16%. This makes this article even more unreliable as an AI generation rating usually higher than 30% usually means that the entire article was generated by AI. As well as this, the article doesn't list any contact information for any possible writer who wrote it, nor if they were a professional in the industry or had the qualifications to say they could be.

Key notes from the article:

Advantages

- High carrying capacity - Trains can easily carry people and can have large-capacity wagons.
- Affordability - Trains can carry many people at once and are energy efficient.
- Reliability - Railway lines are less affected by weather conditions and traffic jams. Also, trains are known to be more consistent in timing.
- Environmental impact - Trains consume less fuel and emit less emissions. This helps improve air quality and reduce carbon footprint.

Disadvantages

- Limited flexibility: Rail transport is a form of transport on certain lines and terminals.
- Operating costs: Rail transport requires high initial costs, such as the construction, maintenance and operation of rail lines. Therefore, it may be difficult to expand the rail network in some areas.

Although this was interesting research to discover about trains, I did not use this in my designs and my final artefact because I was focusing more on bus routes.

Advantages and Disadvantages of Trams[5]

Available from: https://capebretonspectator.com/2020/02/26/pros-and-cons-and-future-of-trams/ by Mary Campbell.

Author:
The author has been listed however there is no link outside of this website to the author's details.

Reliability:
This article is unreliable as although it tells the reader the author's name, it gives no additional data about the actual author, possibly making it a biased opinion as Mary could be considered unqualified. This is evident as well when Mary makes facts on trams by opinions as she "believes" that "people like them". This could make her not a professional in the tram industry as her author profile is blank and it doesn't mention anything about any qualifications that she has done to support the fact that she is an expert in the industry. It also doesn't provide a direct link to any website that Mary is a part of on the website either.

Key notes from the article:

Advantages

- Comfort - tend to brake and accelerate more gently, so you're relatively comfortable, even if you're standing the whole way.
- High capacity – capacity can be increased at rush hours simply by adding a car (or cars) instead of adding another bus (with another driver).

Disadvantages

- Hard to move/remove - tram lines are not easily removed.
- Hard to mix with other forms of transportation - cannot go around obstacles, they don't mix well with bikes, they take up too much space
- High operational costs - "they cost a fortune"

Although this was interesting research to discover about trains, I did not use this in my designs and my final artefact because I was focusing more on bus routes.

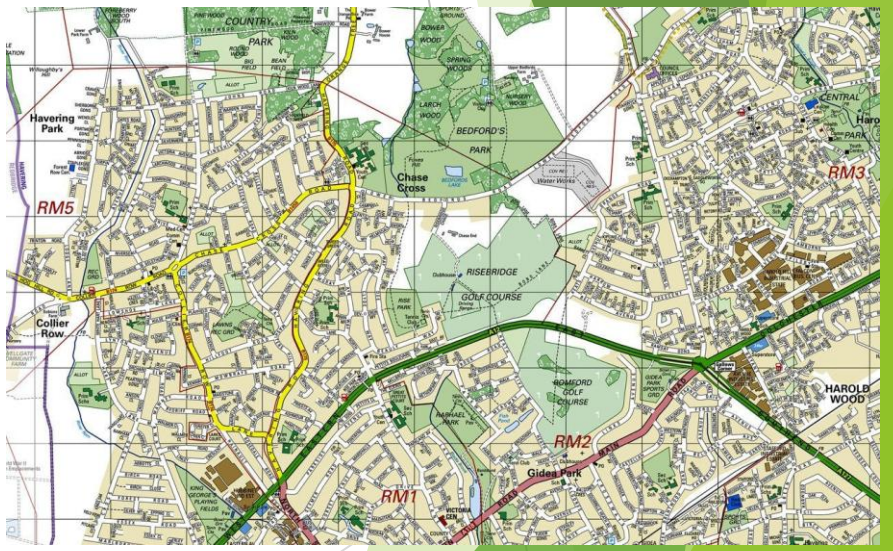
Resources I will require:

A computer running Windows[6]

The reason why I require a computer running Windows is because Windows has more support for many different programs compared to Apple's Mac and also this would be the main device I would be using to actually create my digital design maps as without a computer I cannot create any digital design maps.

Map software[7]

The reason why I require map software is because this would be the software I would use to actually have access to a map to able to edit and make my designs as without a map I would not be able to specifically design a specific route.

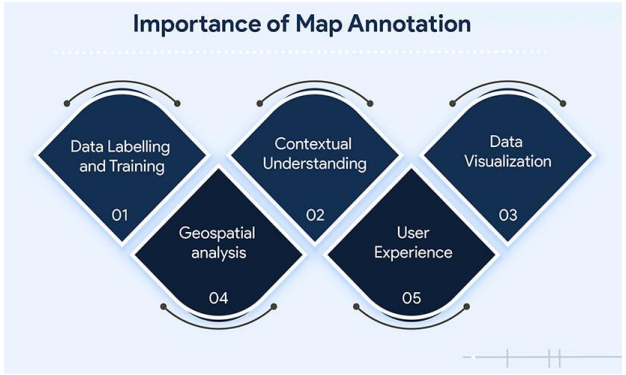


Paint software[8]

The reason why I require paint software is because this would the software, I would use to have access to some form of digital painting materials that I could then edit the map with otherwise I would not be able to directly show my specific route.

Annotation software[20]

The reason why I require annotation software is because accurately annotated design maps help in representing geographical features and to allow people to understand what the actual map is about.



Harold Wood, Cranham and North Ockendon - proposed changes to bus routes 346, 347 and 497[9]

Available from: https://diamondgeezer.blogspot.com/2024/01/extinguishing-497.html by diamond geezer[9a]
https://www.romfordrecorder.co.uk/news/24788551.tfl-347-bus-connecting-romford-upminster-scrapped// by Charlotte Anderson[9b]

Author:
The first article is a blog post, and although we do not know the author's real name, it links to other social medias which the author is also active on. Meanwhile, the second article was written by Charlotte Anderson who is a reporter for the Romford Recorder.

Reliability:
This first article is reliable as it links its research to the official Transport for London proposals that occurred via the main proposal page, TfL website (https://ehq-production-europe.s3.eu-west-1.amazonaws.com/dc45c5b9f651c0e41f3570e875a3f59b2c7df62d/original/1704877288/0507ce52b6a5f05db951229cd06a3dad_Consultation_report_-_Harold_Wood_and_Upminster_bus_changes.pdf?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIA4KKNQAKICO37GBEP%2F20241129%2Feu-west-1%2Fs3%2Faws4_request&X-Amz-Date=20241129T111527Z&X-Amz-Expires=300&X-Amz-SignedHeaders=host&X-Amz-Signature=a07dbab9039cf62ec11cf59e4db918f472d021c0b89686623b7fe65f38a65a9a)[9c], Ian Armstrong's London Buses website which is well-known for having reliable sources regarding to London's bus network. However, the article could be considered unreliable because never does the article mention the author's name, so we don't exactly know who created the article, or if it was AI generated.

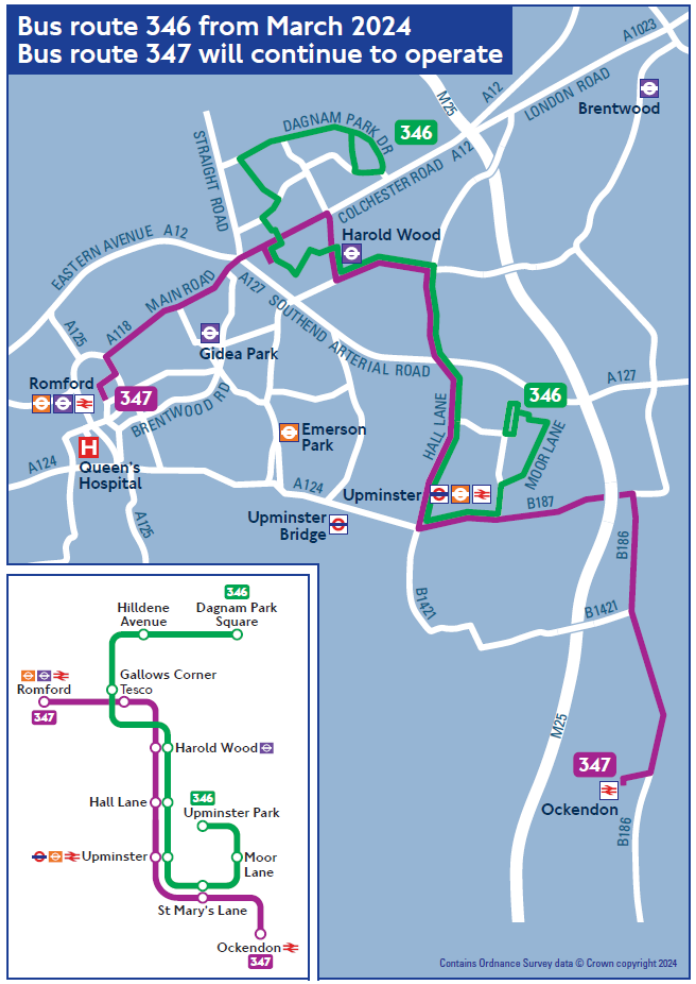
The second article is reliable as it contains the contact information for the author as well as the authors name, and that she reports for other newspapers.

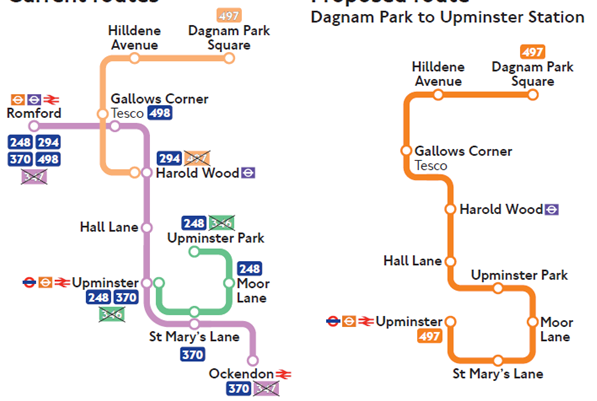
Key notes from the article:

In the first article, Transport for London announced a proposal on March 6, 2023, to tweak three bus routes in the London Borough of Havering. These were Routes 346, 347 and 497. Before the proposal was announced, Route 346 operated as a single-decker service, Mondays to Saturdays only, between Upminster Station and Upminster Park Estate via Cranham, making it one of the shortest routes within not only Havering but across the entirety of Greater London. Route 347 operated between Romford Station and Ockendon Station via Gallows Corner, Harold Wood, Upminster, Cranham and North Ockendon, Mondays to Saturdays only and only 4 times a day, and connected many vulnerable residents within the London borough to the nearby shopping centers and schools of the area. It is also known as the least frequent bus route in the entirety of Greater London, surpassing Routes 389 and 399 which used to be the least frequent. Route 497 had only started three years before the proposal as a mainly Hail and Ride service between Harold Wood Station and Harold Hill. Transport for London originally wanted to withdraw both Routes 346 and 347 and replace this by an extended Route 497 from Harold Hill to Upminster Station via Upminster Park Estate and Cranham before going round on St Mary's Lane back to Upminster Station. This was criticized however because this new route would have gone on a 15 minute detour approaching Upminster Station for no reason and residents argued it would stop serving roads that required a London bus service as they would be removed if the detour happened (e.g. Moor Lane in Cranham on Route 346 as a hail and ride road, which the proposed Route 497 would not serve as it would go via Front Lane entirely). While Transport for London argued that residents have access to the 248 in these areas, residents criticized this statement as some residents who live in Cranham don't live nearby to a bus stop that is served by the 248 and so may have to walk at least half a mile which would be a problem for those who are less able to walk, elderly or are disabled, which Route 346 was introduced to solve. As well as this, the removal of Route 347 would have meant that Clay Tye Road in North Ockendon and Cathedrals Estate in Cranham would no longer have access to a London bus service, with Cathedrals Estate not having a bus service at all. While TfL argued that residents in North Ockendon and Clay Tye Road could use Essex operated Route 269 before changing to Route 370 for Romford and Upminster, residents argued that this route had longer timetable gaps and only takes you to Brentwood and Grays unless you get off in either South Ockendon or North Stifford and even then Route 269 doesn't accept Oyster cards or Freedom Passes so it would cost more to have to get on this route everyday. As for Cathedrals Estate, residents heavily criticized TfL actions saying that residents would have to walk 600 metres to the nearest bus stop through an alley with a pedestrian only connection and currently no lighting, which could be a struggle for those less able to walk or the disabled. Also, on part of the road on St Mary's Lane there is also no pavement so residents who live at Franks Cottages cannot walk to the bus stop even if they wanted to.

Meanwhile, in the second article, Transport for London announced that as of January 18 2025 that Route 347 would be withdrawn even with strong objections, and they were continue to argue that it is a waste of money in this area and that Essex Route 269 connects residents still and that Route 346 now covers most of Route 347 so there is no reason for Route 347 to exist, and the frequency on Route 370 was increased to ensure that residents could still be connected.

Overall, this research was very useful as I utilised some of Route 347 between Upminster and Ockendon Station for inspiration through my designs and my final artefact, especially since residents of Cranham and North Ockendon are isolated.





Upminster and Corbets Tey – Route 373[10]

Available from: https://www.london.gov.uk/who-we-are/what-london-assembly-does/questions-mayor/find-an-answer/373-bus-route-0[10a]
https://essexbuschronicles.fandom.com/wiki/London_Buses_route_373[10b]

Overall, this research was very useful as I utilised some of the route between Corbets Tey and Upminster for inspiration through my designs and my final artefact, especially since residents of Aveley Road are isolated.

Author:
The first source from the Mayor of London's website, which provides answers to the London Mayor's Question times.
The second source is from my own previous research I have done on this specific route which would classify it as both a primary and secondary source.

Reliability:
The first article is reliable as it references the specific date and time that the question was asked which was on February 20, 2008, between 10:00 to 13:00.
It was asked by Richard Barnes who is a part of City Hall Conservatives to the Mayor and has links to all of these individuals and their organizations. It also has a reference number for each individual question and provides both the original question asked and the answer provided from the Mayor.

Meanwhile, the second article is reliable as it tells who edits the article every time a change is made and the original creation date, and it is the same individual each time (me) and also uses secondary sources that the person owns (me). The person (me) also specifically edits the article to include each specific day that an event occurred and documents the entire history of this specific route.

Key notes from the articles:

In the first article, it was stated by the Mayor that Route 373 operated as a commercial service between Upminster and Grays by Arriva at this specific moment in time and that most of the route is in Thurrock (Aveley, Belhus, Lakeside, North Stifford and Grays). The route operated under a London Local Service Agreement (LLSA) and so therefore was not a London Buses contract. Although it was mentioned that Routes 347, 370 and 372 would partially replace the withdrawn route, a small section of this route between Corbets Tey and Aveley, which the question mentions as Aveley Road, would not be covered by alternative services due to only 20 trips per day occurring in this area. It was then said to be unjustifiable to offer a service on this basis. The question was written with the concern that the withdrawal of this route would result in people living on Aveley Road, Harwood Hall Lane and part of Romford Road in Havering without a bus service, and as Aveley Road has no pavement, it makes it impossible to walk up the road alongside heavy volumes of traffic on the road.

In the second article written by me, it mentions that Route 373 originally was introduced in 1975 as a Rainham-Grays service replacing withdrawn London Country service Route 371, but it wasn't until 1987 that the route went to Romford. It then ran between Romford and Tilbury Docks as a albeit indentical route to Route 370 except via Aveley and Belhus, however, was soon withdrawn back to Grays from Tilbury soon after being extended to Romford. It was then rerouted on October 25, 1990, to serve the new Lakeside Shopping Centre when it opened. On September 14, 1991, the Rainham to Grays limited-service section was withdrawn and replaced partially by new Route 323. On October 10, 1998, it replaced the Belhus section of Route 323 and the Aveley section of Route 348 which was made an express service between Belhus and Lakeside. On April 28, 2007, after costs from accepting TfL passes and fares, the route was restructured and so was withdrawn between Romford Market and Upminster Station and this section was replaced by Route 370. However, the restructuring was not a success as by March 30, 2008, the route was withdrawn perhaps due to the loss of connection to Romford and so later the same day was replaced by Ensignbus route 22 between Upminster and Grays.

To the right is a 1998 London bus map attached which has been edited by me to show Route 373.

Romford and Emerson Park – Liberty Line[11]

Available from: https://www.romfordrecorder.co.uk/news/24122021.romford-upminster-overground-route-named-liberty-line/ by Riddhi Kachhela.

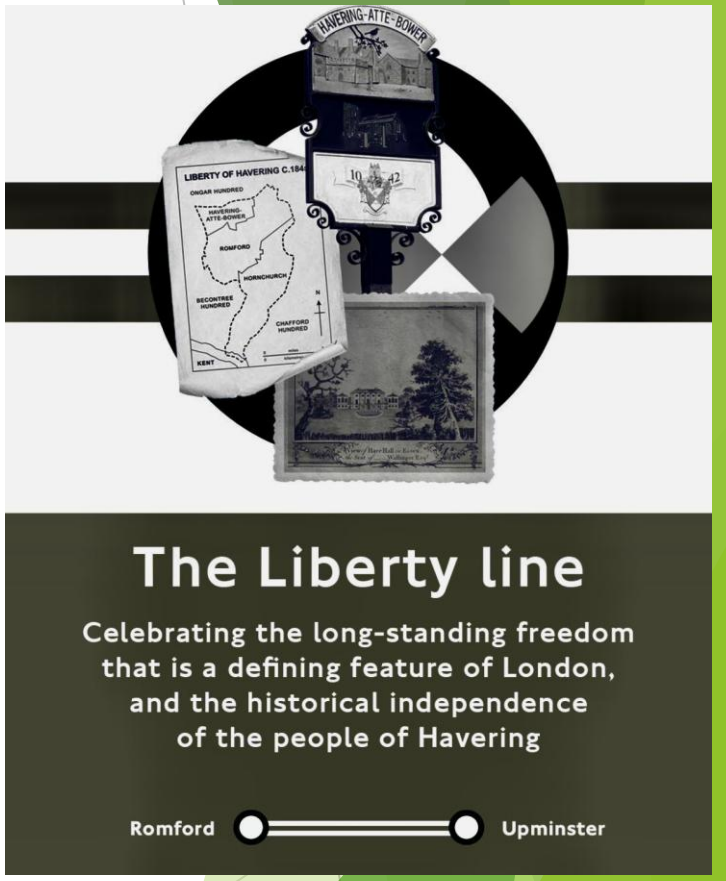
Author:
The article was written by Riddhi Kachhela on February 15, 2024, during the process of when my EPQ research occurred and is a very recent date, who is mentioned to be a trainee reporter and previously worked as a screenwriter and producer and graduated from Goldsmiths University with a degree in journalism.

Reliability:
The first article is reliable as it references the specific date that the article was written and mentions the author's name. It also mentions her X profile which proves to us that she is a real person and not just an AI bot. It mentions she holds a degree in digital journalism which proves that she is qualified to be able to be a reporter for the Romford Recorder and that this source isn't biased.

Key notes from the article:

It was stated that, by Mayor of London Sadiq Khan, the renaming of the Romford-Upminster line to the Liberty line "references the historical independence of the people of Havering". Although some have said positive things about the renaming alongside TfL, Havering Council leader Ray Morgon said "We would ask why funding has been chosen to deliver this rebranding instead of the initiatives that improve the lives of our residents, such as the liveable neighbourhood projects, the upgrade to Gallows Corner and extending the Superloop to include Havering?". Meanwhile, Councilor David Taylor said "Whilst celebrating our success in changing the map of London and marking it with our freedom, we must ask why the Mayor of London decided to spend millions on renaming lines in the first place." This clearly shows that Havering is not very pleased with the renaming as it was a waste of money in their eyes and that money could have been put to better use like fixing actual transportation issues within the borough.

Although this was interesting research to discover about Romford and Emerson Park, I did not use this in my designs and my final artefact because I was focusing more on Upminster and Cranham.



Hacton – Tunnel Express[12]

Available from: https://diamondgeezer.blogspot.com/2017/12/across-hacton-void.html by diamond geezer[12a], https://www.timetablegraveyard.co.uk/Scanned_Counties/prefixed/Thames_Weald-Thurrock_As_at_19930900.pdf by Timetable Graveyard[12b] and https://www.signal-training.com/ebeg/Heffernan.pdf by David Harman[12c].

Overall, this research was very useful as I utilised some of the route between Hornchurch and Upminster for inspiration through my designs and my final artefact, especially since residents of Hacton are isolated.

Author:
The first article is a blog post, and although we do not know the author's real name, it links to other social medias which the author is also active on and was written on December 5, 2017.
The second article does not have an author on it but is a scanned artefact of a timetable for the Tunnel Express service from September 1, 1993.
The third article is an academic article written by David Harman on December 9, 2000, regarding an interview he had on April 1, 1998, with the person who created the Tunnel Express service (Dr H. Nesbitt Heffernan).

Reliability:
The first article is reliable as the author links their research to reliable sources and maps of the existing areas within Hacton since the withdrawal of the Tunnel Express in 1998 and how this has affected the local area of Hacton, creating the "Hacton Void" where it is unsafe to walk down the county lane seperating Hacton from Aveley further than the Optimist Tavern as the pavement is either overgrown or blocked by bollards before eventually fading away, and showing how it is impossible to live in Hacton without access to private transportation, showing just how much this isolates residents.

The second article is a timetable for the Tunnel Express shortly before its eventual withdrawal in 1998, dated September 1, 1993, and is a reliable source as this specific website is known to archive most routes timetables that were part of the London Bus Services as well as Non-London and London Local Service Agreement bus timetables. It also has links to other websites well known for being reliable due to the number of sources they use. This is also reliable as it mentions the exact date the timetable took effect.

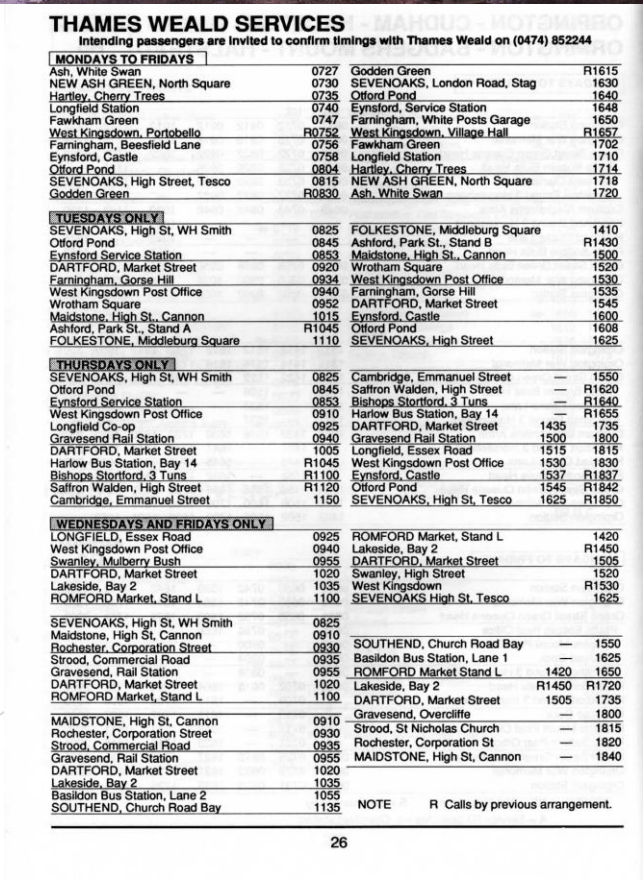
The third article is a reliable source as it was originally published in issue 96 of the Omnibus Society Provincial Historical Research Group Newsletter and says it was based on notes taken based on an interview displaying the actual date that it happened on and even mentions some of the exact words he said on that day in quotation marks. David Harman is also a member of the Essex Bus Enthusiast Group which is a group designed to preserve Essex independent and major companies bus routes and their history.

Key notes from the articles:

In the first article, it is said that only Route 193 is one of only current routes serving a very small position of Hacton, that being where the convenience store is but other than that doesn't serve Hacton Lane directly where most of the residents live. One former county lane remains that is pedestrian friendly but only leads from the community hall to the Hacton Bridge and the Optimist Tavern. Past the Optimist Tavern, the county lane is not pedestrian friendly, as it has pavement that is either overgrown or blocked by bollards or even just not existing as it fades away soon after. Originally, the entire lane was lined by cottages but most of the villagers moved away from this away in the 19th century. It is impossible to live in this area of London without access to a private vehicle but luckily these five families living down this county lane have access to a car. There is then a choice of two county lanes, one that leads towards Corbets Tey and down the way which former route 373 used to go down towards Upminster or one that leads to Aveley and Thurrock via Aveley Road however as mentioned from my previous research into this road, most of the road has no pavement and so this causes yet another issue especially for residents who don't have access to a car.

In the second article, the timetable dated September 1, 1993, can be found for the Tunnel Express service when Thames Weald operated the service prior to 1998. At this specific time, Hacton was only served twice a week (Wednesdays and Fridays) and only twice a day in each direction by this specific route. Residents had to either be out of their house by 10:40 or risk not having access to a bus service until the next time that the Thames Weald service arrived.

In the third article, it mentions that the creator of the service (Dr H. Nesbitt Heffernan) was originally a psychiatric doctor but changed to being a bus service introducer as he said carefully "one had the opportunity to pursue other interests". Therefore, his company, Thames Weald Travel Society (later to become Thames Weald Ltd) was born, originally running a Sevenoaks-Gravesend route. One day, he drove to Essex to have a look around and decided that Romford with its extensive shops and large open-air market fitted the bill. He then applied for a license for a route carefully designed to avoid treading on LT or Eastern National's routes. He at one point also operated a service to Crawley but soon realized that his employee hired in Crawley had been privately hiring his bus to other people when he noticed a Chessington World of Adventures sticker on the bus, so that brought an end to the Crawley service. He operated the service from the late 1960s to March 28, 1998, when his license expired as he could no longer afford to run the service and as the main route involved navigating the massive amounts of traffic on the M25, there was some anxiety on the part of passengers over being piloted by an 80-plus year-old driver that was probably justified. He later died on November 6, 2000, at around 88 years of age, as he was born sometime in 1912.



THAMES WEALD SERVICES

Intending passengers are invited to confirm timings with Thames Weald on (0474) 852244

MONDAYS TO FRIDAYS

Ash, White Swan	0727	Godden Green	R1615
NEW ASH GREEN, North Square	0730	SEVENOAKS, London Road, Stag	1630
Hartley, Cherry Trees	0735	Otford Pond	1640
Longfield Station	0740	Eynsford, Service Station	1648
Fawkham Green	0747	Farningham, White Posts Garage	1650
West Kingsdown, Portobello	R0752	West Kingsdown, Village Hall	R1657
Farningham, Beesfield Lane	0756	Fawkham Green	1702
Eynsford, Castle	0758	Longfield Station	1710
Otford Pond	0804	Hartley, Cherry Trees	1714
SEVENOAKS, High Street, Tesco	0815	NEW ASH GREEN, North Square	1718
Godden Green	R0830	Ash, White Swan	1720

TUESDAYS ONLY

SEVENOAKS, High St, WH Smith	0825	FOLKESTONE, Middleburg Square	1410
Otford Pond	0845	Ashford, Park St., Stand B	R1430
Eynsford Service Station	0853	Maidstone, High St., Cannon	1500
DARTFORD, Market Street	0920	Wrotham Square	1520
Farningham, Gorse Hill	0934	West Kingsdown Post Office	1530
West Kingsdown Post Office	0940	Farningham, Gorse Hill	1535
Wrotham Square	0952	DARTFORD, Market Street	1545
Maidstone, High St., Cannon	1015	Eynsford, Castle	1600
Ashford, Park St., Stand A	R1045	Otford Pond	1608
FOLKESTONE, Middleburg Square	1110	SEVENOAKS, High Street	1625

THURSDAYS ONLY

SEVENOAKS, High St, WH Smith	0825	Cambridge, Emmanuel Street	—	1550
Otford Pond	0845	Saffron Walden, High Street	—	R1620
Eynsford Service Station	0853	Bishops Stortford, 3 Tuns	—	R1640
West Kingsdown Post Office	0910	Harlow Bus Station, Bay 14	—	R1655
Longfield Co-op	0925	DARTFORD, Market Street	1435	1735
Gravesend Rail Station	0940	Gravesend Rail Station	1500	1800
DARTFORD, Market Street	1005	Longfield, Essex Road	1515	1815
Harlow Bus Station, Bay 14	R1045	West Kingsdown Post Office	1530	1830
Bishops Stortford, 3 Tuns	R1100	Eynsford, Castle	1537	R1837
Saffron Walden, High Street	R1120	Otford Pond	1545	R1842
Cambridge, Emmanuel Street	1150	SEVENOAKS, High St, Tesco	1625	R1850

WEDNESDAYS AND FRIDAYS ONLY

LONGFIELD, Essex Road	0925	ROMFORD Market, Stand L		1420
West Kingsdown Post Office	0940	Lakeside, Bay 2		R1450
Swanley, Mulberry Bush	0955	DARTFORD, Market Street		1505
DARTFORD, Market Street	1020	Swanley, High Street		1520
Lakeside, Bay 2	1035	West Kingsdown		R1530
ROMFORD Market, Stand L	1100	SEVENOAKS High St, Tesco		1625
SEVENOAKS, High St, WH Smith	0825			
Maidstone, High St, Cannon	0910			
Rochester, Corporation Street	0930	SOUTHEND, Church Road Bay	—	1550
Strood, Commercial Road	0935	Basildon Bus Station, Lane 1	—	1625
Gravesend, Rail Station	0955	ROMFORD Market Stand L	1420	1650
DARTFORD, Market Street	1020	Lakeside, Bay 2	R1450	R1720
ROMFORD Market, Stand L	1100	DARTFORD, Market Street	1505	1735
		Gravesend, Overcliffe	—	1800
MAIDSTONE, High St, Cannon	0910	Strood, St Nicholas Church	—	1815
Rochester, Corporation Street	0930	Rochester, Corporation St	—	1820
Strood, Commercial Road	0935	MAIDSTONE, High St, Cannon	—	1840
Gravesend, Rail Station	0955			
DARTFORD, Market Street	1020			
Lakeside, Bay 2	1035			
Basildon Bus Station, Lane 2	1055			
SOUTHEND, Church Road Bay	1135			

NOTE R Calls by previous arrangement.

26

The statistics of Havering's transportation network and comparison to other local London boroughs[13]

- According to the TfL website, Havering has four London Underground stations on the District line, three Elizabeth line stations, three London Overground stations and around 870 bus stops. As well as this, TfL also states that there is 36 day routes in Havering (https://tfl.gov.uk/info-for/boroughs-and-communities/havering)[13a], however this has been proven wrong where the borough report on the same website after being counted only shows there are really only 23. routes that operate during the day in Havering, with two of the services (Routes 347 & 497) being withdrawn according to the recent Quarter of Route Performance Results (havering.pdf)[13b]. Overall, this makes Havering have a route withdrawal rate of 8% (2/25) as of just this year.
- Compared to local borough Barking and Dagenham, they have the same amount of bus routes operating in the area with the recent Quarter of Route Performance Results (https://bus.data.tfl.gov.uk/boroughreports/barking-dagenham.pdf)[13c], however TfL states that Barking and Dagenham (https://tfl.gov.uk/info-for/boroughs-and-communities/barking-and-dagenham)[13d] have five London Underground stations compared to Havering's four, but apparently they have less Elizabeth line stations at only one and only one Overground station (which is incorrect because the information has not been updated but they have two, Barking and Barking Riverside). As well as this, Barking and Dagenham has less bus stops, with TfL saying there is around 385 bus stops in Barking and Dagenham compared to 870 in Havering.
- However, compared to Redbridge, Redbridge has a higher amount of bus routes compared to both Havering and Barking and Dagenham at a total of 33 routes that operate during the day. (https://bus.data.tfl.gov.uk/boroughreports/redbridge.pdf)[13e]. However, they have more bus stops compared to Barking and Dagenham, but less than Havering, at a total of 510 bus stops across the borough. They also have ten London Underground stations and four Elizabeth line stations which is significantly more than compared to Havering and Barking and Dagenham. However, unlike Barking and Dagenham and Havering, Redbridge does not have any London Overground stations. (https://tfl.gov.uk/info-for/boroughs-and-communities/redbridge)[13f]

The statistics of Havering's transportation network and comparison to Essex boroughs[14]

- According to the Thurrock Council website[14a], there are a total of 26 bus routes operating across the borough, one of which is a school only service (007) and two of which are Transport for London routes (370 & 372). Removing these services, there is only a total of 23 bus routes in Thurrock, which is the same as Havering. As for rail services, there is a total of seven c2c stations in the borough, four of which (Purfleet, Ockendon, Chafford Hundred Lakeside and Grays) are part of the London fare Zone 10 on the Oyster PAYG (Pay as You Go) card (https://www.c2c-online.co.uk/app/uploads/2024/05/664b5c23b083d-664b5c23b083eNew_Assisted_Travel_Map_PreOval_2.pdf.pdf/)[14b]. This compares with the eleven stations in Havering where Thurrock has four less.
- According to Traveline[14c], there are a total of 24 bus routes operating across the Brentwood borough, two of which are Transport for London routes (498 & 608). Removing these services, there is a total of 22 bus routes operating in Brentwood, which is one less than Havering. As for rail services, there is a total of three Greater Anglia services (two of which also served by the Elizabeth line), two of which (Brentwood and Shenfield) are in Zone 9 and Zone 12 on the Oyster PAYG (Pay as You Go) card (https://www.greateranglia.co.uk/cdn-cgi/image/fit=contain,width=1150,format=avif,quality=75/sites/default/files/assets/media/image/image/2022-06/10531-ga_using_oyster_payg_map.jpg/)[14d], as well as one c2c station at West Hordon. This compares with the eleven stations in Havering where Brentwood has seven less.

My research which I have gathered using a Microsoft Forms form about the local community and how they feel about the lack of transport:

- I decided to get the opinions of my local community for primary research about transportation in the local area of Havering and decided to invite both first year students and second year students to answer 10 questions regarding these issues and from here gather statistics and analyze different responses. Altogether, I got a total number of 158 responses.
- Question 1 was about whether students in the sixth form were local residents of the London Borough of Havering, and 46% of students (a total of 72 students) live within the London Borough of Havering. Meanwhile, 54% of students in the sixth form (a total of 86 students) do not live in the London Borough of Havering and live in different London boroughs or Essex.

- Question 2 was a follow-on from Question 1 regarding how the student answered in the previous question. If they said no previously in Question 1, they would answer what London Borough or relevant borough they lived in.

- 32% of students (a total of 30 students) who answered this question said that they lived in the London Borough of Barking and Dagenham, while 15% of students (a total of 15 students) said that they lived in the London Borough of Redbridge. 11% of students (a total of 11 students) said that they lived in the London Borough of Newham while only 1% of students (exactly one individuals) said that they lived in London Borough of Tower Hamlets. This in turn gives the final percentage for those who live in a London borough that is not Havering to be an average of 66 out a total of 86 students, with an actual total of 57 out of these 86 still living in a London borough. This further emphasizes that there are a lot of people who still live in different London boroughs that require access to transportation in Havering and so therefore more services are required to ensure that these students can get to sixth form on time as they live quite far away.

- 15% of students (a total of 11 students) said that they lived in the borough of Thurrock in Essex, while 3% of students (exactly three people) said that they lived in the borough of Southend-on-Sea in Essex. A further 4% of students (a total of 4 students) said that they just live in Essex. This brings the final percentage for those who live outside of the London boroughs to an average of 20 out of a total 86 students, with an actual total of 16 out of these 86 living outside of London. This further emphasizes that these students do not have very good access to the area of London directly and so require extra services to ensure that they are not late to sixth form and cannot enter London.

- The other 6 responses from students said that they either lived in the London Borough of Havering (as seen when Romford, Havering and Harold Hill were mentioned) or were talking about issues with the transportation system even though this question was not about this and so these responses to this question were removed to make the results fair.

1. Are you a local resident in the London Borough of Havering?

2. If the answer to the above is no, can you please state what London borough or relevant borough you live in.

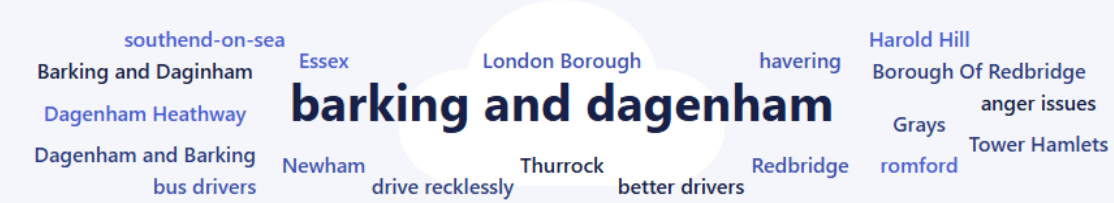
More details

92
Responses

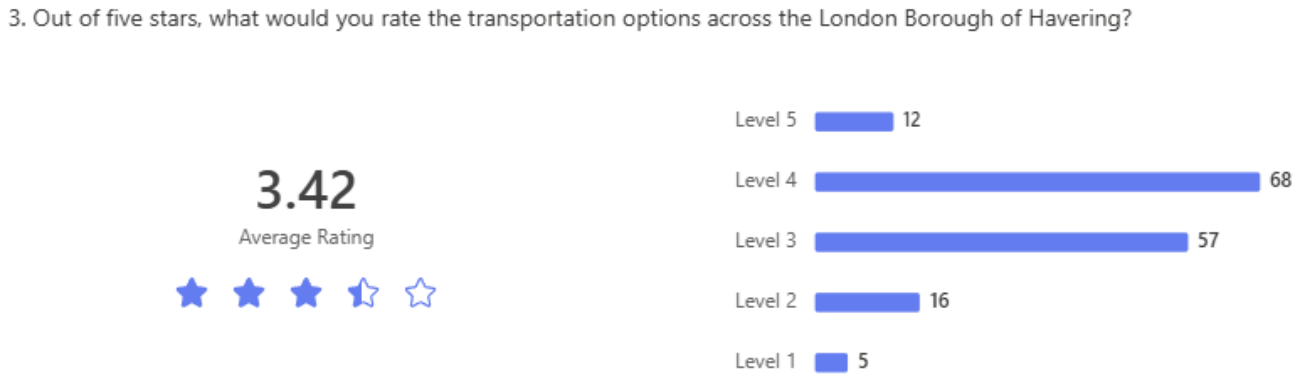
Latest Responses
"Grays"

27 respondents (30%) answered barking and dagenham for this question.

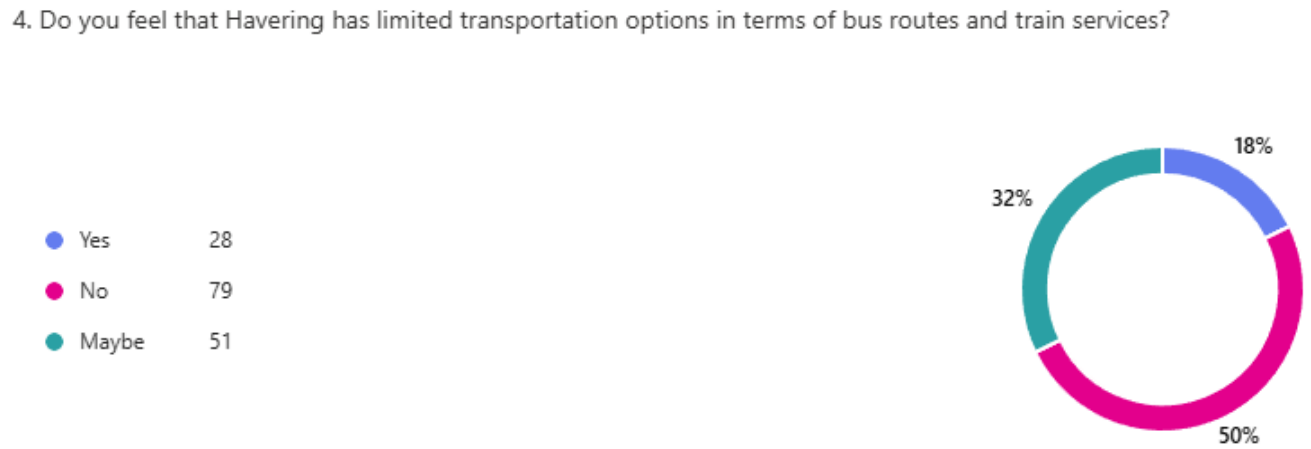
Update



- Question 3 was about how students overall found the transportation options across the borough of Havering and asked students to give a rating from one to five. The rating that was the highest chosen was 4 stars out of 5 at a total of 68 students, following behind with 3 stars out of 5 which had a total of 57 students rating it this. A total of 33 students chose other options that were not either Level 4 or Level 3. Altogether, the average rating that was given for the London Borough of Havering's transportation system was 3.42 out of 5, which means that there is improvements to be made on the transportation network within Havering and that is what my artefact is trying to achieve.


3. Out of five stars, what would you rate the transportation options across the London Borough of Havering?
3.42
Average Rating
Level 5 12
Level 4 68
Level 3 57
Level 2 16
Level 1 5

- Question 4 was asking students if they felt that Havering has limited transportation options in terms of buses and trains. Overall, the responses were half and half with either students voting yes, maybe or no. Exactly 50% of students (79 students) said No, meanwhile 32% of students (51 students in total) said Maybe, and 18% of students (28 students in total) said Yes. This shows that there is a divide in this area in terms of public transportation available and so they must be fixed, which is what I aim to do.



- Question 5 was a follow-up question to Question 4 where students would comment about why they feel that Havering only has limited transportation options and a total of 38 responses were given for this question. The main reasons that students were concerned was that the cost of public transportation is too high, buses being too packed or do not come frequently enough. Other reasons also include that bus stops are frequently closed due to constant road works and so they can't get on their bus to get wherever they need to go, there isn't a wide enough range of places they go to, bus drivers can be rude to students, there is only one route for certain destinations (e.g. 372 for Lakeside), there is no direct train service from Romford to Upminster Bridge so students therefore rely on the 248 or 370 or must wait 25 minutes on the train before then boarding the 248 or 370 at Upminster, alongside no direct route to Barking and requiring you to go to Stratford to get to most other places. This clearly shows to me that there is a lack of transportation within the London Borough of Havering, and this is even affecting the people who go to my sixth form.

- Question 6 was a question asking whether students knew about any recent withdrawals of transportation services within the London Borough of Havering (like the 347 back in January 2025 and the 497 in 2024). Altogether, 120 respondents out of 158 (76%) did not know about these withdrawals which is concerning as a vital service to many commuters no longer exists which just shows me that Transport for London is not spreading information well to the public as according to their information, they regularly make materials accessible regarding changes to services which seems to not be the case in this matter. However, 27 students responded that they did know about these withdrawals (17%) which shows that the information did at least reach a couple people who knew what was going on and who may have relied on these services. 11 students also responded Maybe (7%) which means that either they may have heard about it from the other 27 students or perhaps may just be aware of changes to transport around them.

- Question 7 was a follow-on question from Question 6 and asked students if they were a local resident or a commuter who frequently goes to Havering to comment on how they think that they were affected them personally or their community. A total of 71 responses were received for this question. The main things that people responded with was that they would have to travel further to reach a possible bus or train station and make have to take trains which cost money compared to buses. Other reasons were that it makes it harder for them to get to sixth form, disallows certain people getting to work, waiting too long for buses, forced people to work out a travel plan in more detail and change using multiple buses alongside reducing transportation options available for those who would take such routes.

5. If the answer to the question above is yes, could you please explain why you feel this way?

More details

38
Responses

Latest Responses
"Most if not all train services require you to go into Stratford in order to get most o... "
...

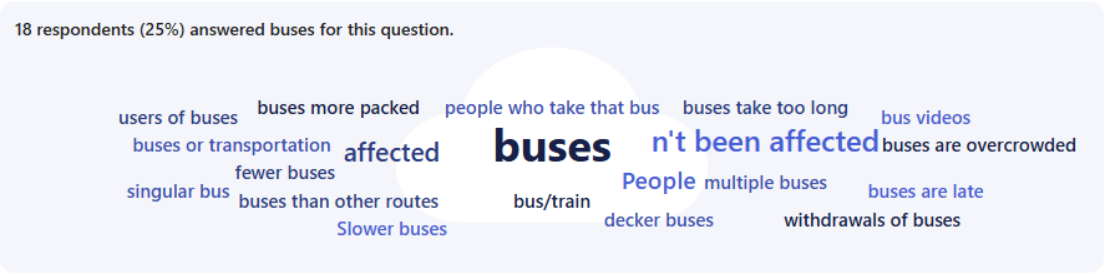
6. Have you recently heard about any recent withdrawals of transportation services in the local area of Havering? (this includes Rou te 347 which was only recently withdrawn back in January and Route 497 back in 2024)

7. If you are a local resident or commuter in the area who frequently goes to Havering, how do you think these withdrawals have af fected you personally or people in your community?

More details

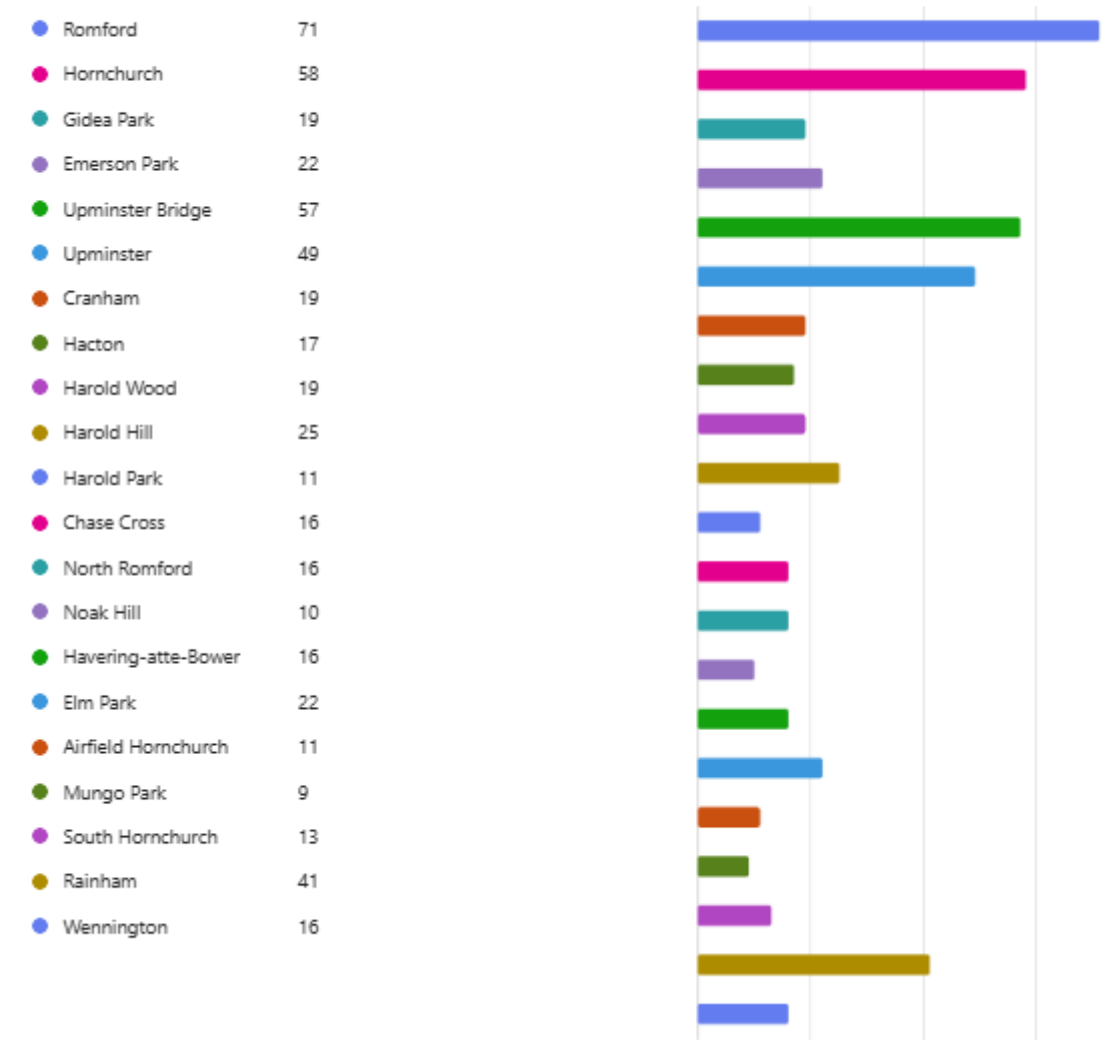
71
Responses

Latest Responses
"Have not affected me, nor did I know these buses existed."
"they havent i walk. but it can make my friends late."
...

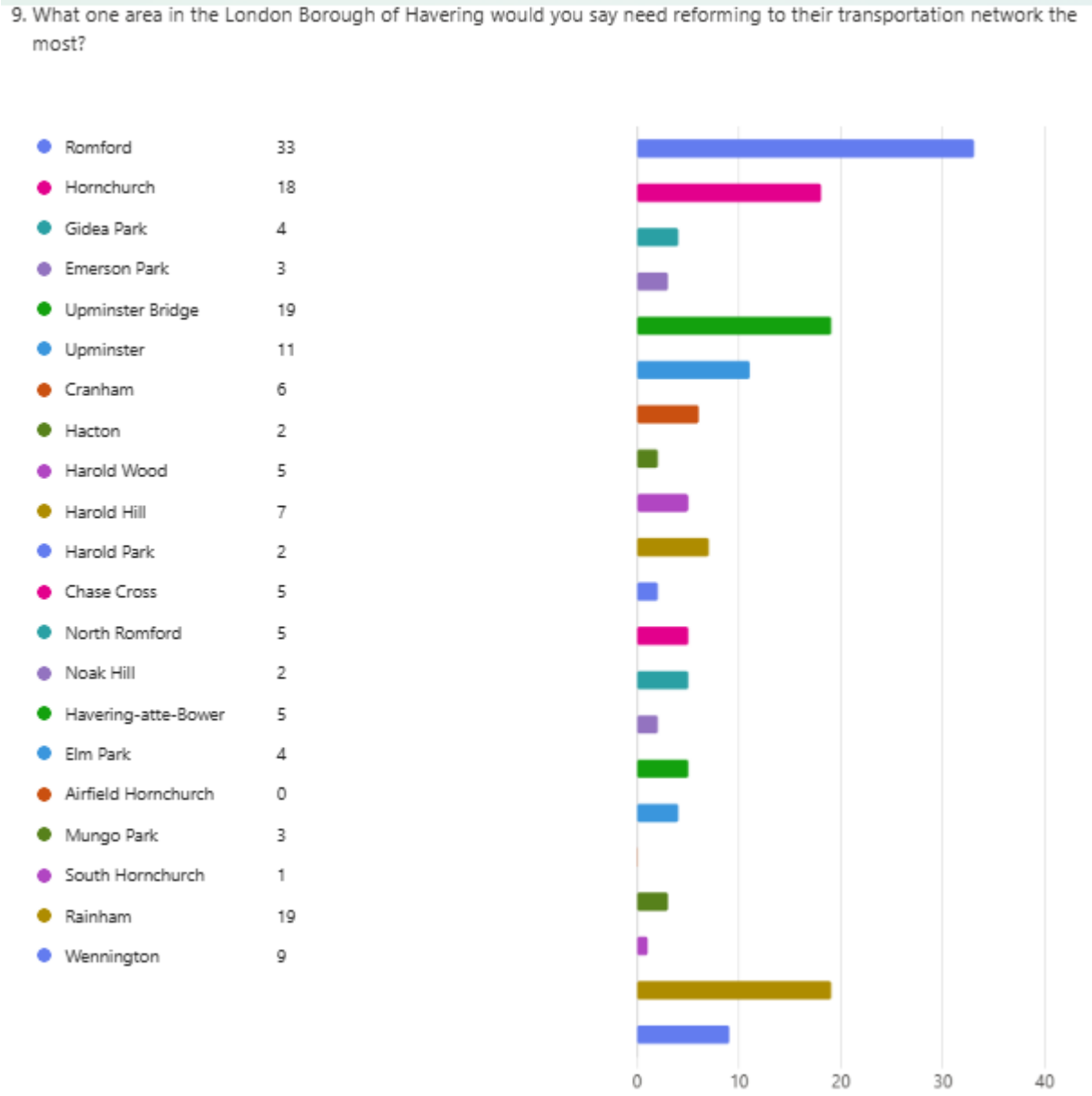


- Question 8 was a question asking what areas in the London Borough of Havering that students would say need reforming with their transportation. Altogether, Romford received the highest number of votes at 71 students, followed closely by Hornchurch at 58 students and Upminster Bridge at 57 students alongside Upminster at 49 students and Rainham at 41 students. Most other options had between 11-25 students voting for them, except for Mungo Park which got the lowest number of votes at only 9. This clearly emphasizes to me that the main towns and districts within Havering are lacking with appropriate transportation and so therefore shows the exact areas where transportation needs to be improved with the areas with the least number of votes not requiring as much reforming as compared to others with higher numbers of votes.

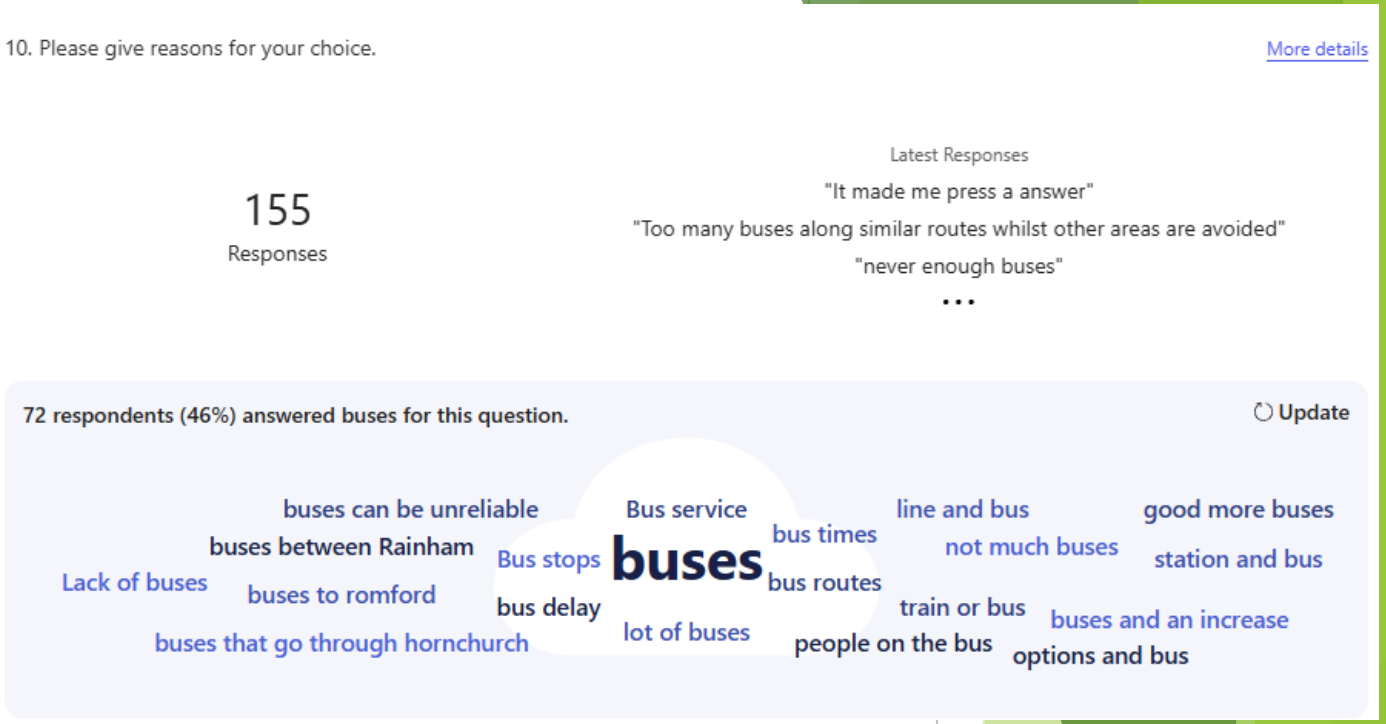
8. What areas in the London Borough of Havering would you say need reforming to their transportation network?



- Question 9 was a question asking what one specific area in the London Borough of Havering that students would say need reforming with their transportation. Altogether, Romford received the highest number of votes at 33 students, followed closely by Upminster Bridge at 19 students and Rainham at 19 students alongside Hornchurch at 18 students and Upminster at 11 students. Most other options had between 1-9 students voting for them, except for Airfield Hornchurch which got the lowest number of votes at 0. This clearly emphasizes to me that Romford is the main town within Havering that is lacking with appropriate transportation and so therefore also shows the exact areas where transportation needs to be improved with the areas with the least number of votes not requiring as much reforming as compared to others with higher numbers of votes.

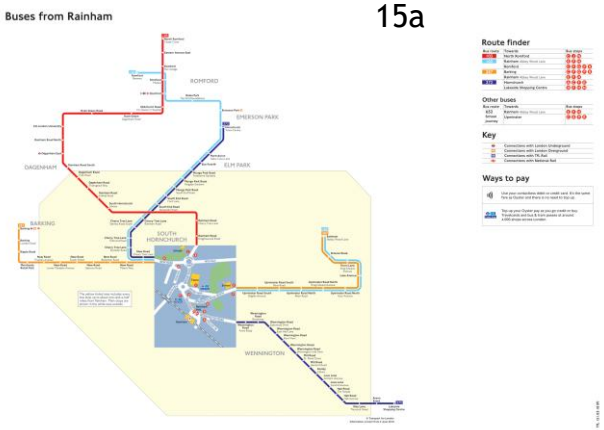


- Question 10 was a follow-up question to Question 9 and asked students to give reasons for the choice that they made for the area that they think had a lack of transportation. Many students have commented that there are too few buses for where you need to get to, no train accessibility, being slow and unsafe or schoolkids being on the transport options, talking about how certain areas heavily rely on one or two routes (Harold Park for an example which only has route 496 and Rainham Village which only has routes 165 and 287), long waiting times and timetable being wrong, buses don't operate on certain days of the week (Sundays usually) or have a very bad timetable, limited train options and the buses are of very poor quality because of how old they are. This shows that there is a divide in this area in terms of public transportation available and so they must be fixed, which is what I aim to do.

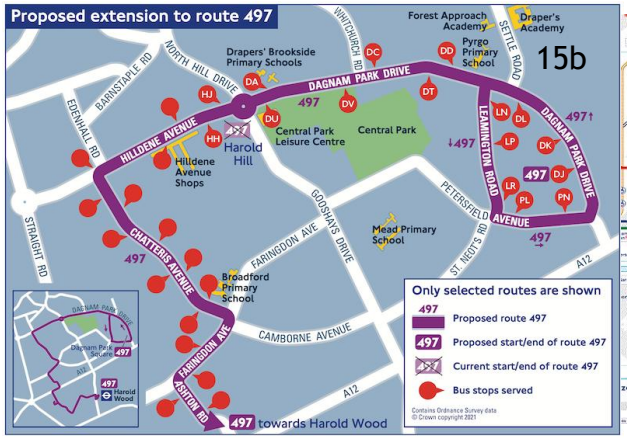


Mood Board of Digital Design Maps made by TfL[15]

15a



15b



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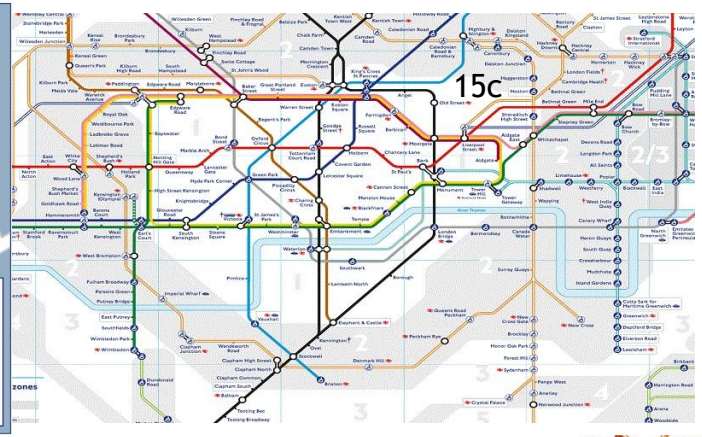
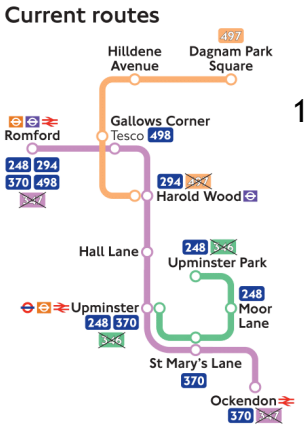


15d

15e



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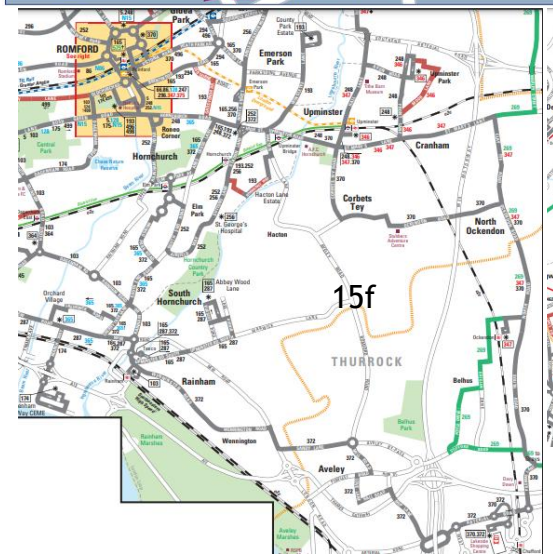
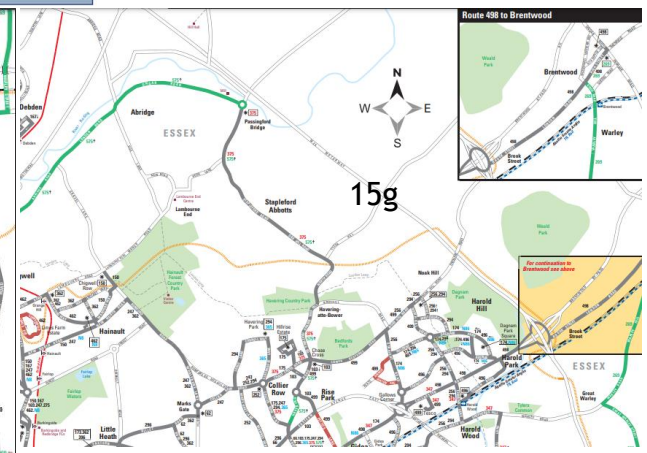
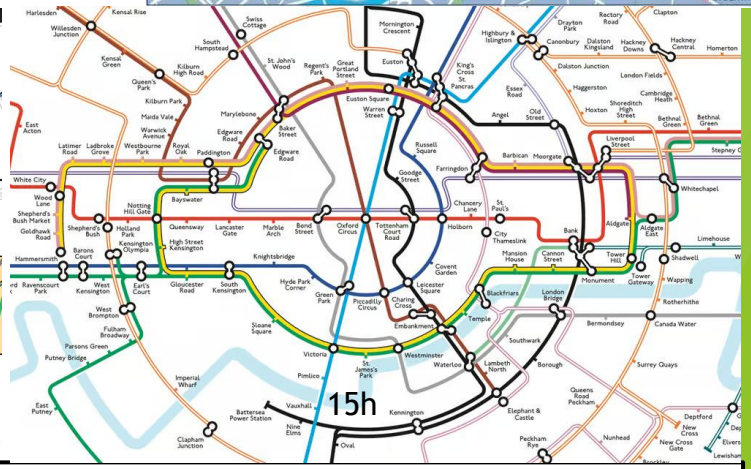


15g



15h



Strengths of these maps:
Mostly abstract as they do not feature unnecessary locations.
User friendly to understand and tell you the places that are important to the area.
Show the designs of the route either in a simplified manner or as it would look in real life.

Weaknesses of these maps:
Some still feature locations that are not abstract such as in 15f with "Rainham Marshes" or "Belhus Park".
Could be harder to understand if you don't know the key to the actual map.
15a, 15c, 15e and 15h don't geographically show how the area looks in real life.

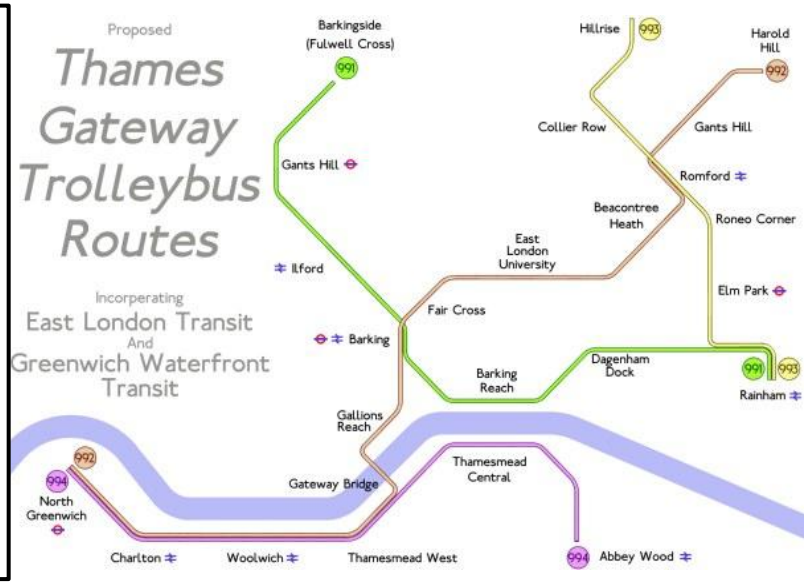
Summary:
The reason why I have made this mood board of all different digital design maps made by TfL throughout the years is to get an idea into what my designs and final design may look like. I also want to gather ideas from other sources that have the sort of mood necessary for digital design maps. This would in turn allow me focus on creating my designs for my digital design maps and in this specific area for which my client Havering Council requires.

Previous artefacts/works designed to solve the problem:

East London Transit[16]:
Proposed by the Electric T-Bus group in 2001 as a cost-efficient way of getting patronage and supplying public transportation to not only Havering but many other local London boroughs and would be using trolleybuses in forms of several routes running as far as Collier Row, Ilford and Harold Hill to North Greenwich and Rainham.

Advantages:
The map depicts the areas of which places would be served and any connections which can be transferred to e.g. National Rail and the London Underground.
It gives each route a different colour in the style of the London Tube Map and simplifies the design of the routes.

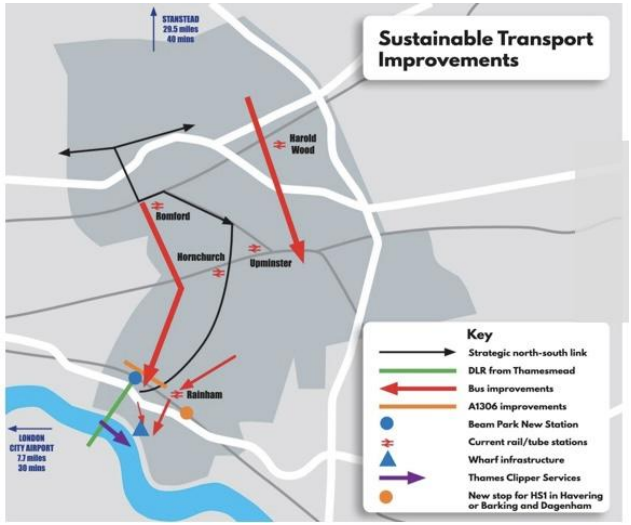
Disadvantages:
It mentions names of areas which aren't necessarily town names and aren't as important as they aren't supposed to be stops on this line e.g. Roneo Corner on Route 993 and East London University and Gateway Bridge on Route 992 which makes it less abstract.

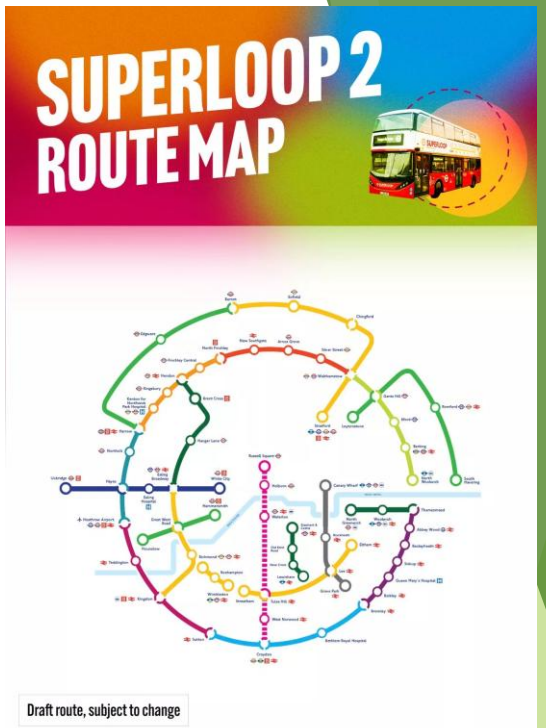


Northern-Southern monorail link[17]:
Proposed in 2023 by Ray Morgon, the leader of Havering Council, to introduce a link across the Northern-Southern districts of Havering in the possible form of a tramway, light rail, bus or "monorail". It was estimated to cost "almost £200,000" to complete but would link Harold Hill/Collier Row to Rainham/Beam Park via Romford and Emerson Park or Upminster.
The main reason this was proposed was because many employers throughout the borough complained that they could not get workers successfully to work due to a lack of transport infrastructure.

Advantages:
The map depicts areas where current transportation links are avaliable as well as possible ideas to get new transportation links to the area.

Disadvantages:
Not very user-friendly as it doesn't separate National Rail stations from London Underground stations and doesn't exactly show how improvements may be carried out on the buses.
Not abstract because it includes locations which aren't necessarily important to Havering including Stansted and London City Airport. It also doesn't exactly explain how a monorail would be carried out as it features existing railway lines.





Superloop 2[18]:
Proposed by the Mayor of London, Sadiq Khan back on May 2, 2024, it was to introduce completely new ideas for Superloop routes and increase the total amount of routes from 10 to 20. There would be two brand new routes, one from Leytonstone to South Havering and one from Stratford to Barnet.

Advantages:
The map depicts the areas of which places would be served and any connections which can be transferred to e.g. National Rail and the London Underground.
It gives each route a different colour in the style of the London Tube Map and simplifies the design of the routes.

Disadvantages:
It doesn't exactly strictly mention town names that are served e.g. South Havering which could apply to South Hornchurch, Rainham or Wennington and possibly Hacton.
Doesn't show all connections to transportation on the map e.g. in Leytonstone which is connected to the Central line nothing is shown to display there is a connection link there.
It isn't exactly abstract as it displays places like Queen's Mary Hospital which aren't towns nor have any relevance to the transportation network.

What I am planning to produce[19]:

Like I said earlier on slide 4, I am going to produce a digital design map that is geographically abstract using possibly several computer-based paint software and map programs alongside annotation programs. I am going to use parts of the map program by taking screenshots and then edit this map using said paint program depending on each area on the borough.

I will need to find out the hardware resources I will require, and which software has the best visual look compared to the other and ones that are easier to navigate and understand.

I want it to be similar in style to the official TfL bus maps of the time prior to 2018 (see map on right which was a Route 372 map from 2002) when the London buses map was withdrawn from circulation and a new release physically never made again.

At the same time, I want it to be realistic and feature locations and town names except I want to also use abstraction to remove unnecessary details.

In the paint program I used I recreated this specific route as an example using these different programs to see what the main differences were.

Comparisons of map software available that I possibly want to use:

- Google Maps

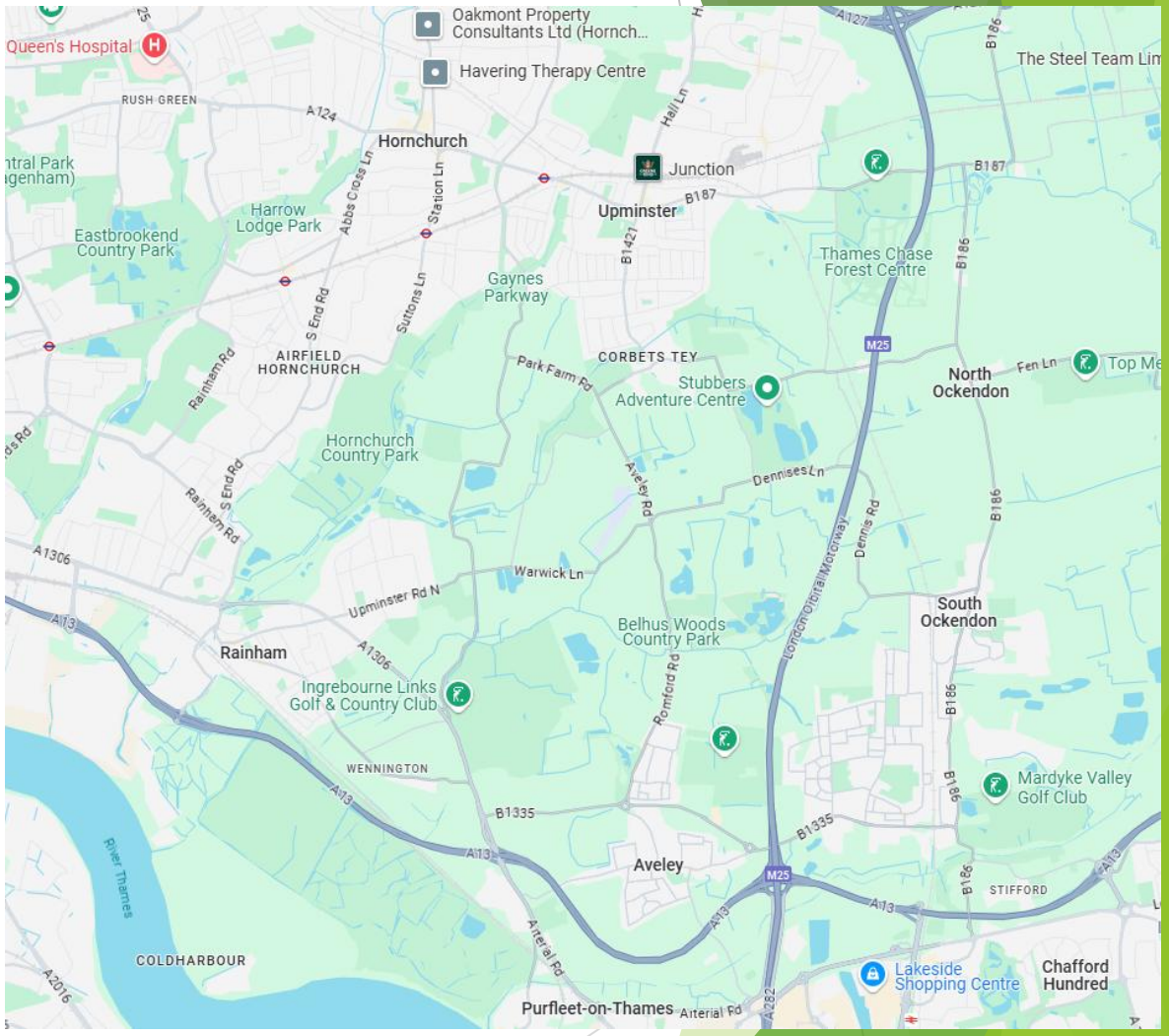
Rating: 5/10

Advantages:

- It has all the main town names of most of Havering, features connection areas where people can transfer to other services as well as places that are used a lot by the public.

Disadvantages:

- Doesn't exactly meet my abstraction requirements as it features locations that are unnecessary in the map such as "Ingrebourne Links Golf & Country Club" as it relies on advertisements.
- Doesn't show certain town names at all such as Elm Park, Cranham and South Hornchurch which can make residents in these areas feel like they aren't getting an improved transportation service.
- Has unwanted scenery and too many street names which also doesn't meet my requirements.
- Too little colors as all roads are colored grey in color which doesn’t differentiate main roads with regular roads.



Comparisons of map software available that I possibly want to use:

- Open Street Map

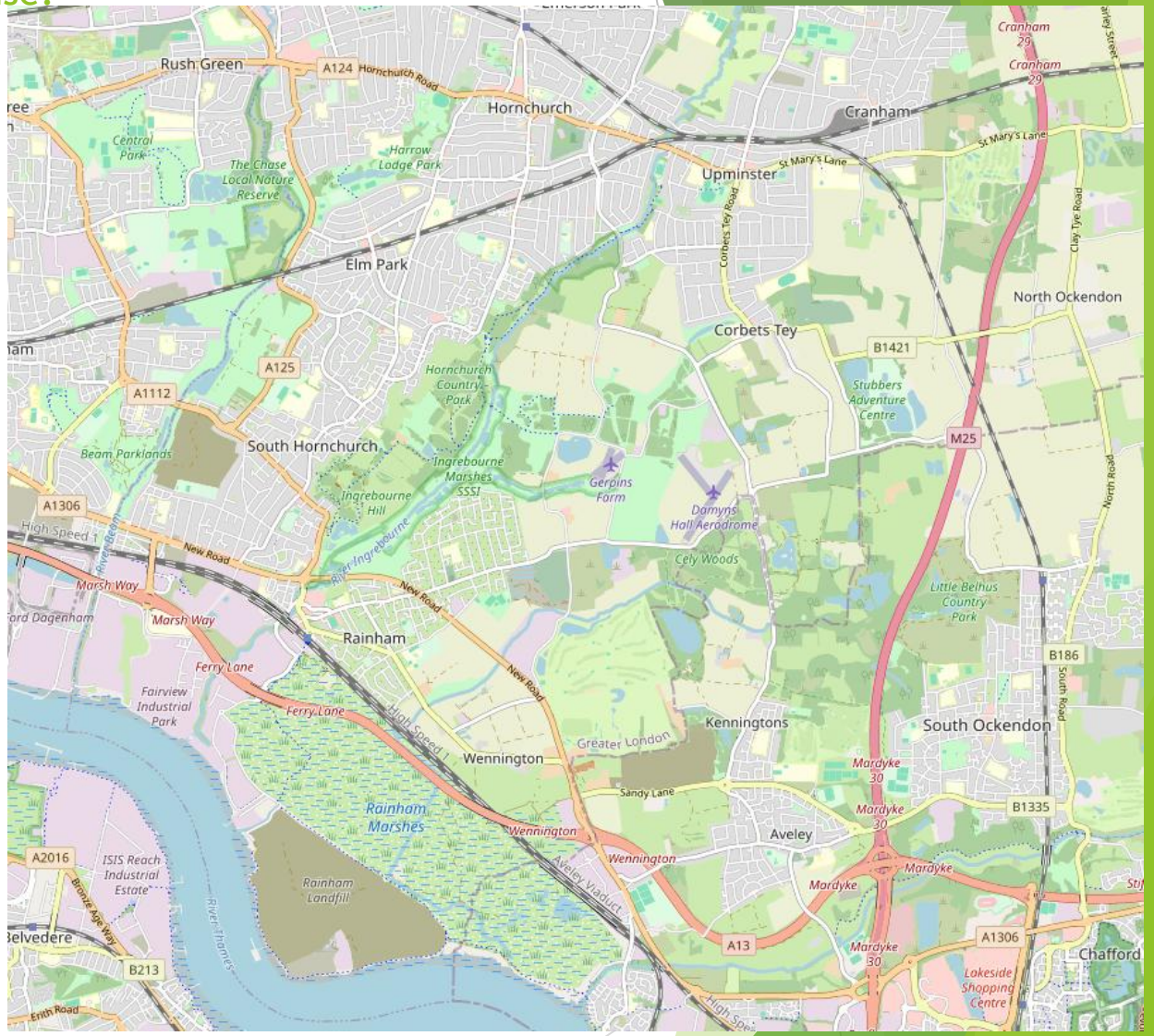
Rating: 7/10

Advantages:

- It has all the main town names of most of Havering, features connection areas where people can transfer to other services as well as places that are used a lot by the public.
- Roads are colored by the type of road they are: if they are a main road, they are red, other main roads are orange and yellow, and normal streets are white instead of all grey that Google Maps used.

Disadvantages:

- Doesn't show certain town names at all such as Hacton which can make residents in these areas feel like they aren't getting an improved transportation service.
- Has unnecessary scenery such as Aerodromes and Woods which are unnecessary for a London transportation digital design map so doesn't fully meet my abstraction requirements.



Comparisons of map software available that I possibly want to use:

- Ordnance Survey Map

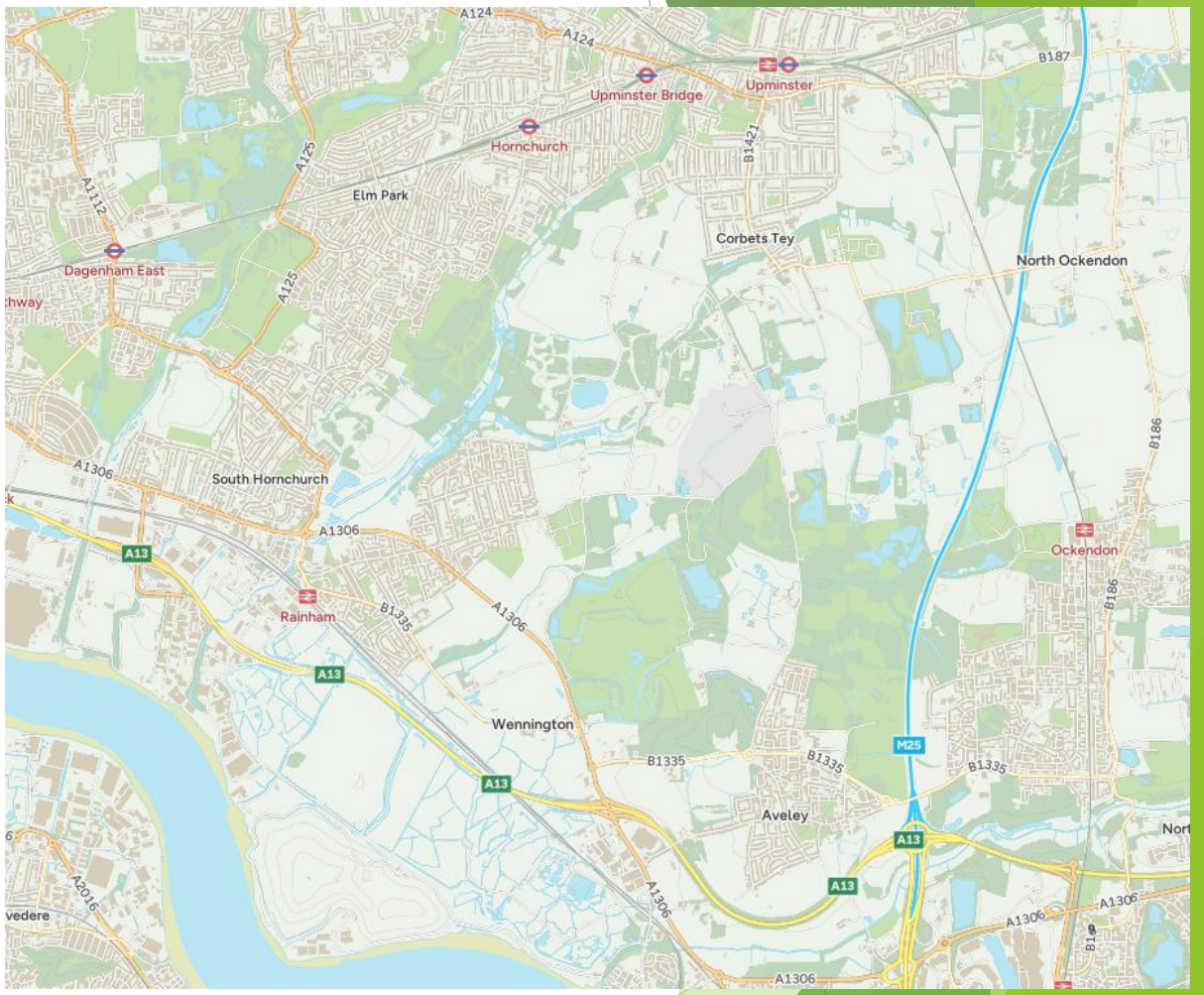
Rating: 9/10

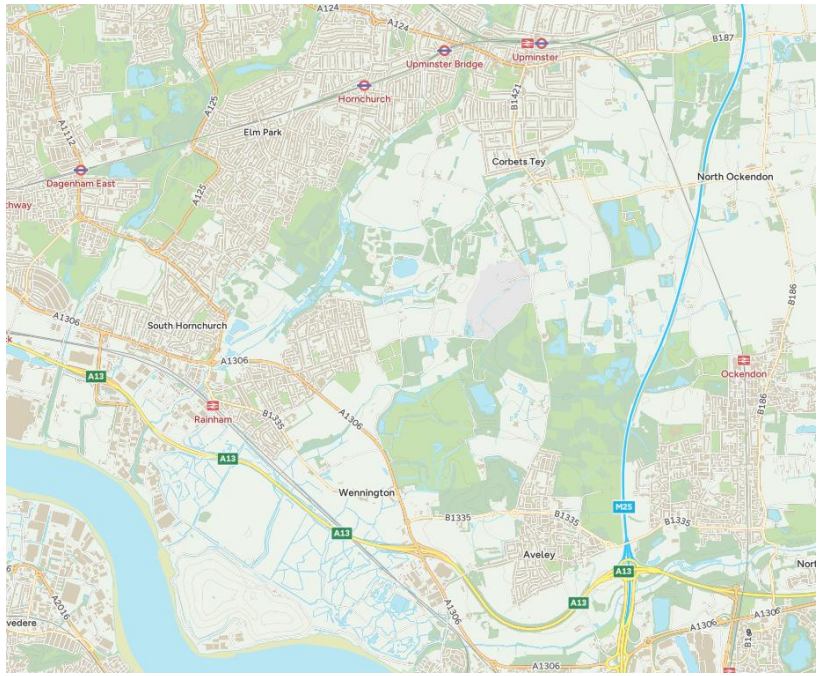
Advantages:

- It has all the main town names of most of Havering, features connection areas where people can transfer to other services as well as places that are used a lot by the public.
- Roads are colored by the type of road they are: if they are a main road, they are red, other main roads are orange and yellow, and normal streets are white instead of all grey that Google Maps used.
- Meets my abstraction requirements as no unnecessary details have been added to the the map.
- Shows stations nearby where people can change to other transportation services.

Disadvantages:

- Doesn't show certain town names at all such as Hacton and Hornchurch which can make residents in these areas feel like they aren't getting an improved transportation service.





Conclusion – Map Software

- In conclusion, I have decided to use the Ordanance Survey Map as my map software to make my digital design map. This is because it has all the main town names of most of Havering and features connection areas where people can transfer to other services as well as places that are used a lot by the public. It also has roads that are colored by the type of road they are: if they are a main road, they are red, other main roads are orange and yellow, and normal streets are white instead of all grey that Google Maps used. Therefore, it meets my abstraction requirements as no unnecessary details have been added to the the map and it also shows stations nearby where people can change to other transportation services. Although, it doesn't show certain town names at all such as Hacton and Hornchurch, it is better than the other two map softwares which have unneccessary features with Google Maps not even having a specific colour other than grey for roads.

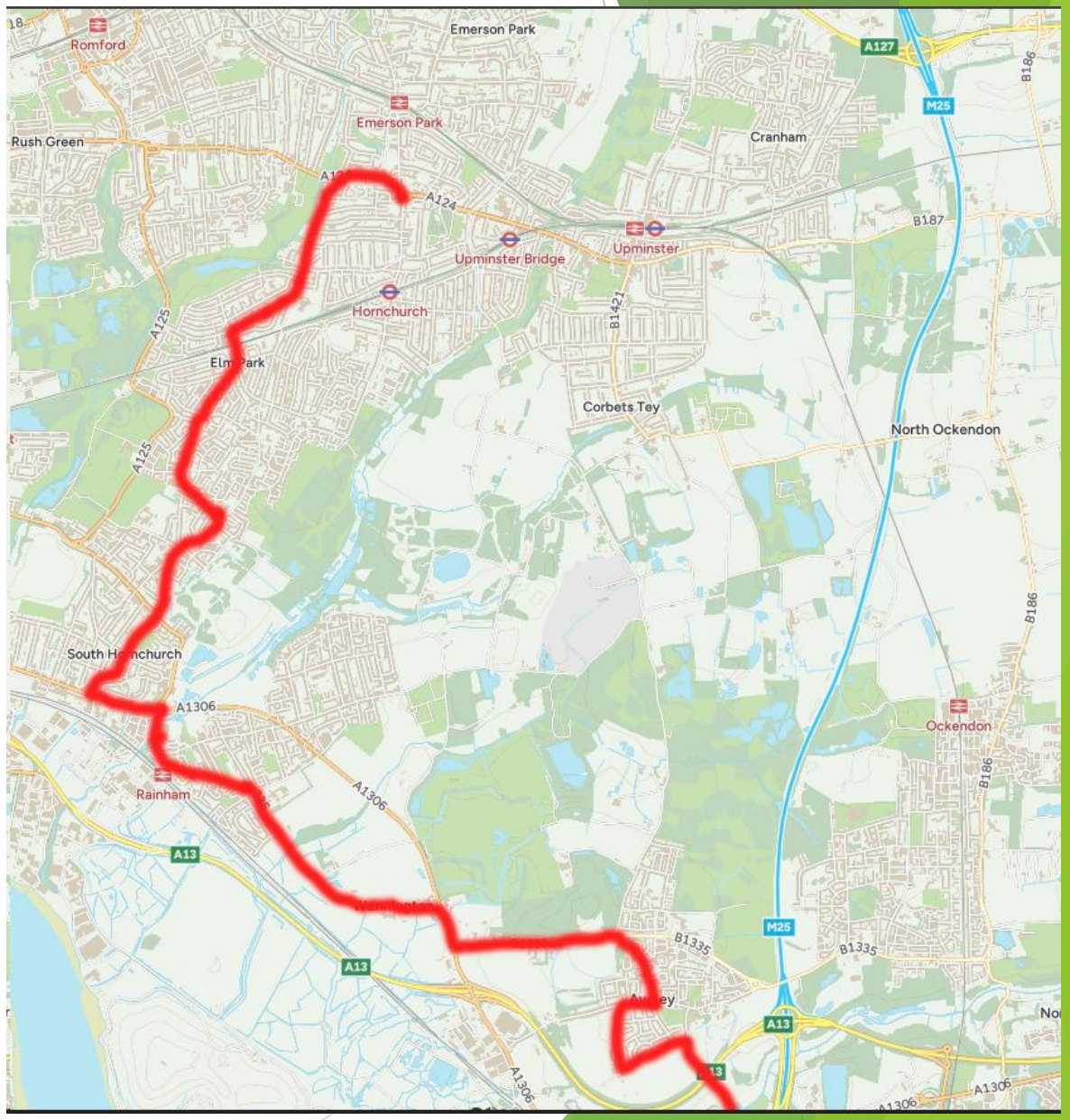
Comparisons of paint software available that I possibly want to use:

- Adobe Photoshop

Rating: 7/10

Advantages:
- Professional-like quality of editing maps.
- Several different painting type options – called "Modes" by the software, I used Normal mode
- Ability to remove the background as each individual "layer" acts as its own different painting.

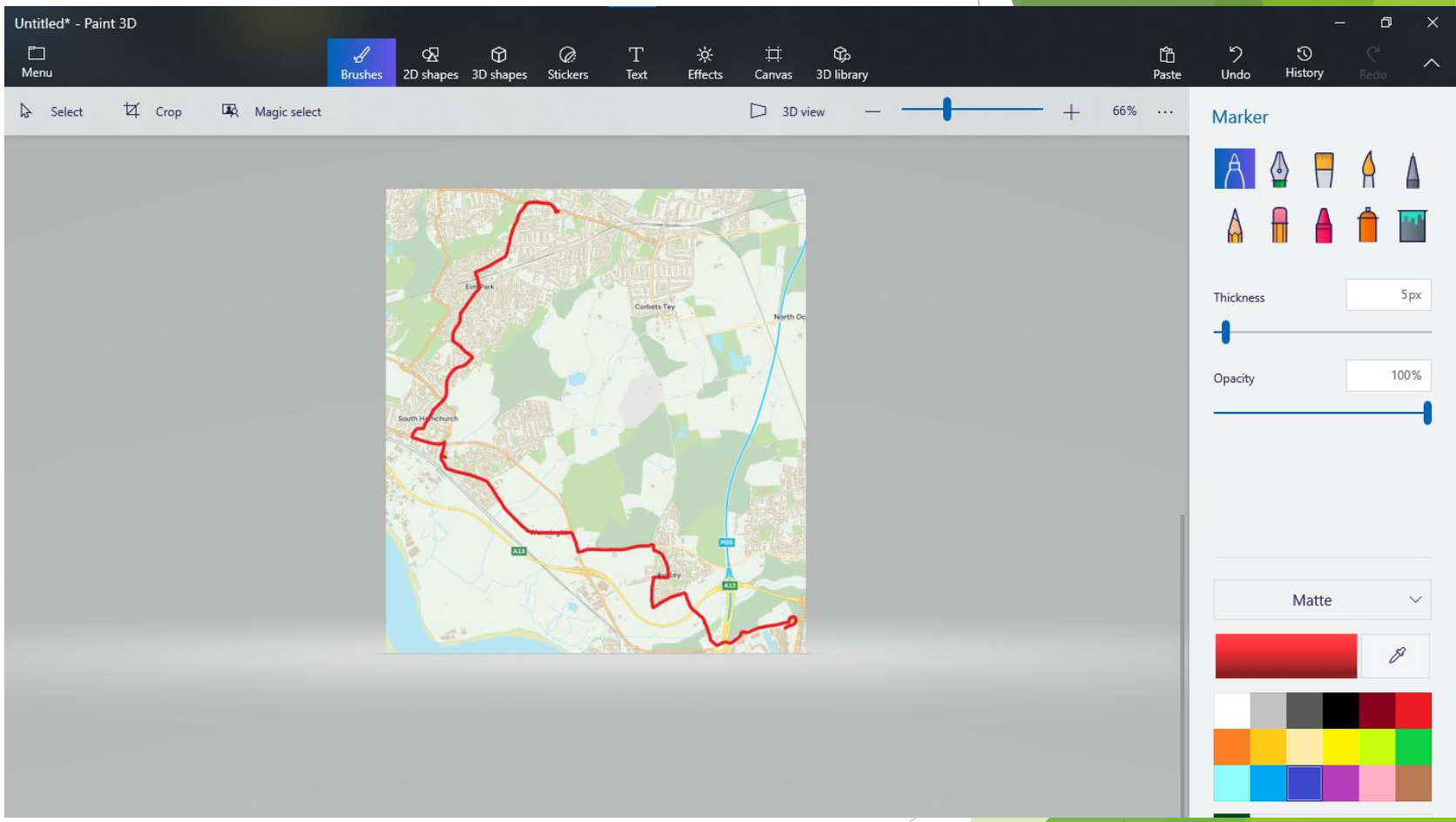
Disadvantages:
- Expensive – costs £21.98 a month on its own or £56.98 a month if all the Adobe apps are all bought together.
- Lacking user-friendliness – tutorials do exist for this software however it can take a very long time to learn the software fully.
- Less support for vector graphics – heavily relies on bitmap graphics which results in pixelated images.



Comparisons of paint software available that I possibly want to use:

- Microsoft Paint 3D

Rating: 8/10



Advantages:

- User friendly interface that is easy to understand.
- Ability to add both 2D and 3D shapes to the design map.
- Ability to add specific lighting effects to the design.
- Ability to easily edit the size of the canvas and photo.
- Free to use – comes bundled with Windows 10.

Disadvantages:

- Lack of scale – difficult to create models without a sense of size/ratio.
- Limited perspective – can only edit the model from one direction.
- No welding/joining – can't create more complex designs and therefore cannot do laying unlike Photoshop.

Comparisons of paint software available that I possibly want to use:

- Microsoft Paint

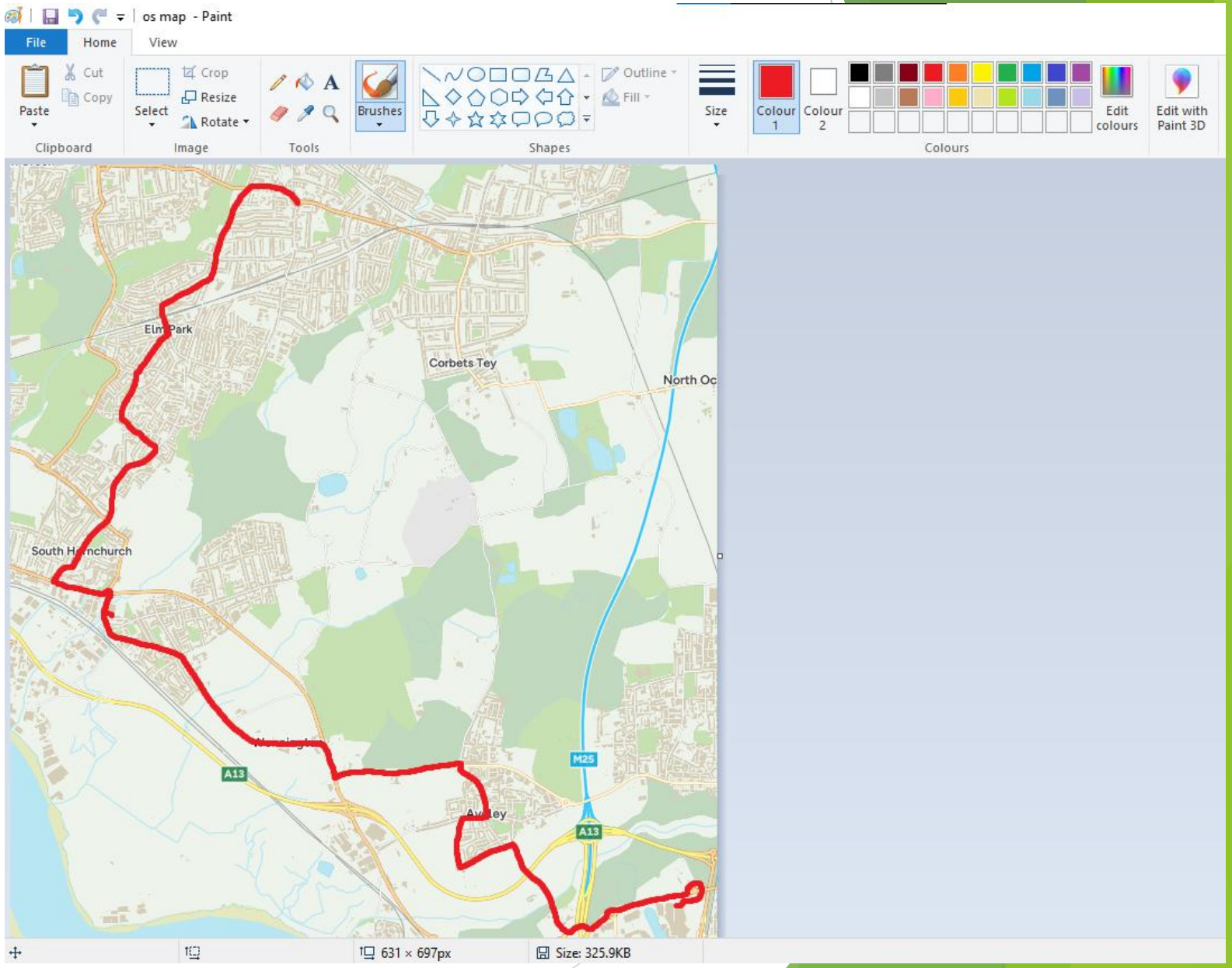
Rating: 5/10

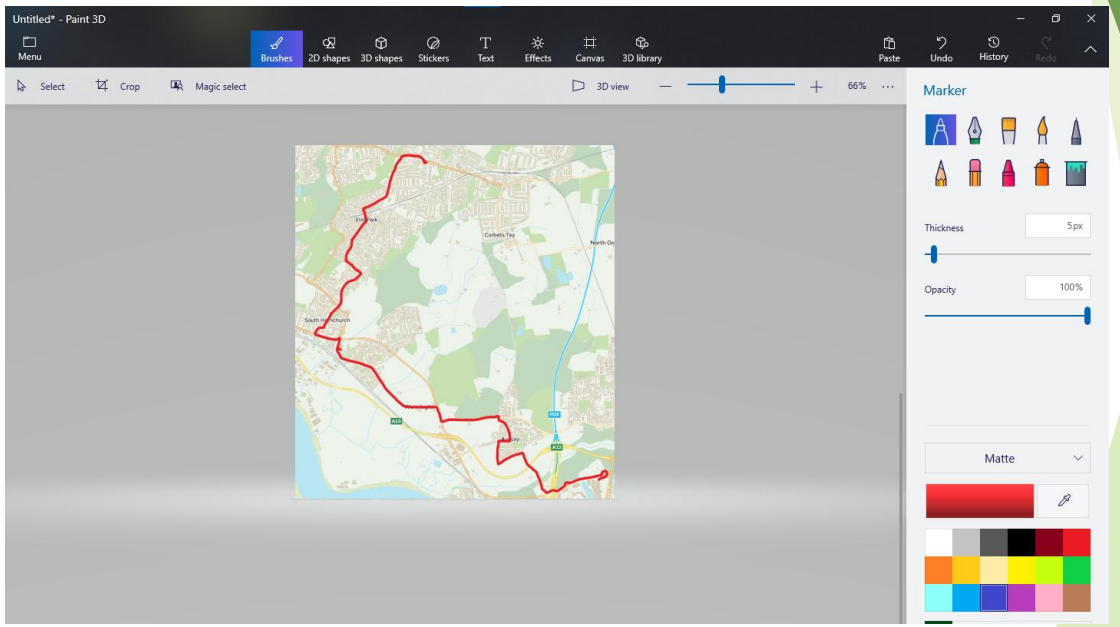
Advantages:

- User friendly interface that is easy to understand.
- Free to use – comes bundled with Windows 10.

Disadvantages:

- Basic editing capabilities – can only really paint, add text or add shapes to the image which doesn't make it an advanced program
- Pixelation – if you upscale a small image the image will appear pixelated as the program doesn't know how to fill in the extra pixels.
- No welding/joining – Like Paint 3D, it can't create more complex designs and therefore cannot do laying unlike Photoshop.
- Deprecated – no longer being actively developed so any bugs found won't be fixed.



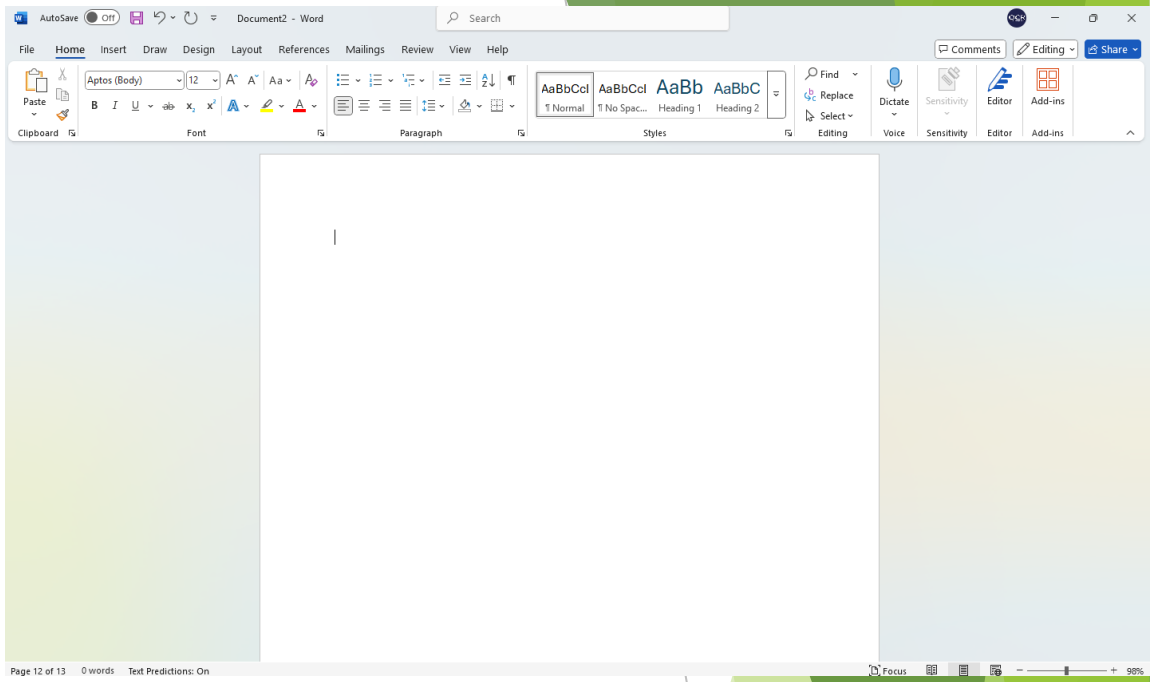


Conclusion – Paint Software

In conclusion, I have decided to use Microsoft Paint 3D as my painting software for my digital design maps. This is because Microsoft Paint 3D has an easy-to-understand user interface unlike Adobe Photoshop and is also free to use as it is bundled with Windows 10. Although it doesn't feature the ability to weld and has a limited perspective, it does better than Microsoft Paint which can only do very basic editing capabilities and causes pixelation when resizing images. Microsoft Paint is also deprecated unlike Microsoft Paint 3D which means bugs found in the software will be unable to be fixed as the development of the software has stopped. Microsoft Paint 3D also unlike Adobe Photoshop has support for vector graphics which results in less pixelated images.

Comparisons of annotation software that I possibly want to use:

- Microsoft Word



Rating: 5/10

Advantages:

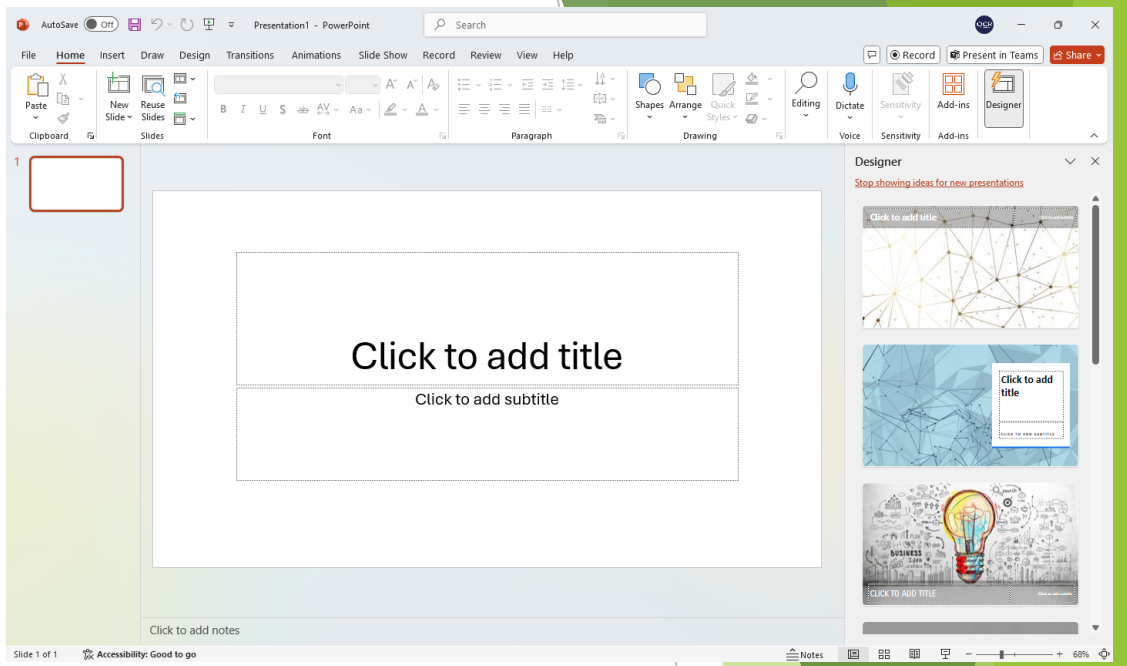
- Easy availability – available on most devices as it comes pre-installed with computers.
- Easy to understand user interface – easy to learn and use in most everyday tasks.
- Can edit images to a level – can add text to images.

Disadvantages:

- Limited customization options – less custom annotations are allowed.
- Annotations can clutter the digital design map.
- File size inflation.

Comparisons of annotation software that I possibly want to use:

- Microsoft PowerPoint



Rating: 7/10

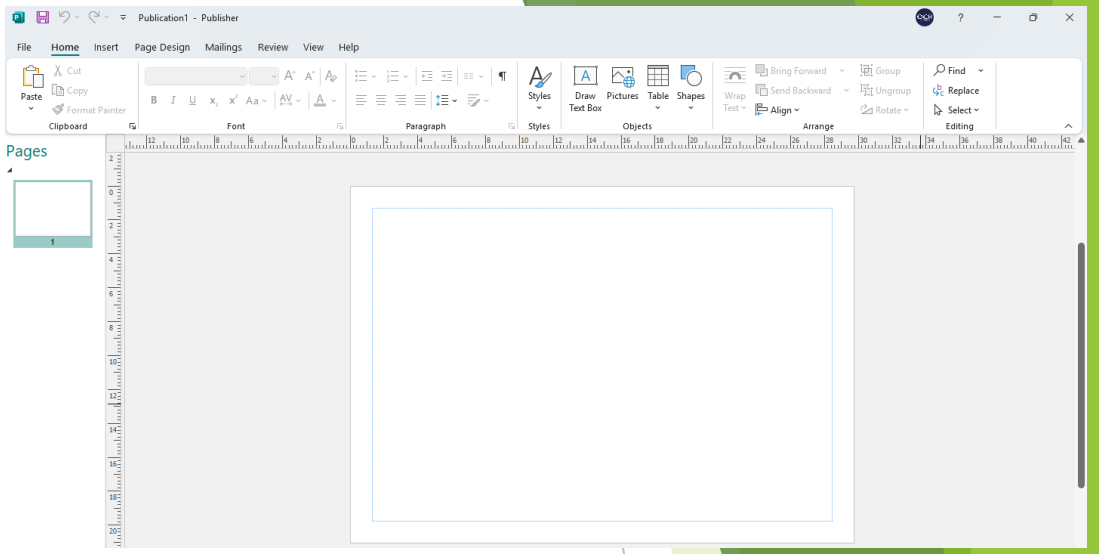
Advantages:

- Easy to manage presentations.
- Easy to understand user interface – easy to learn and use in most everyday tasks.
- Can save into many different formats.
- Can create intriguing slides.
- Offers excellent data visualization.

Disadvantages:

- Over-reliance on slides.
- Information overload from too much information at once.
- Files are not backed up automatically and can be big in size.

Comparisons of annotation software that I possibly want to use:



- Microsoft Publisher

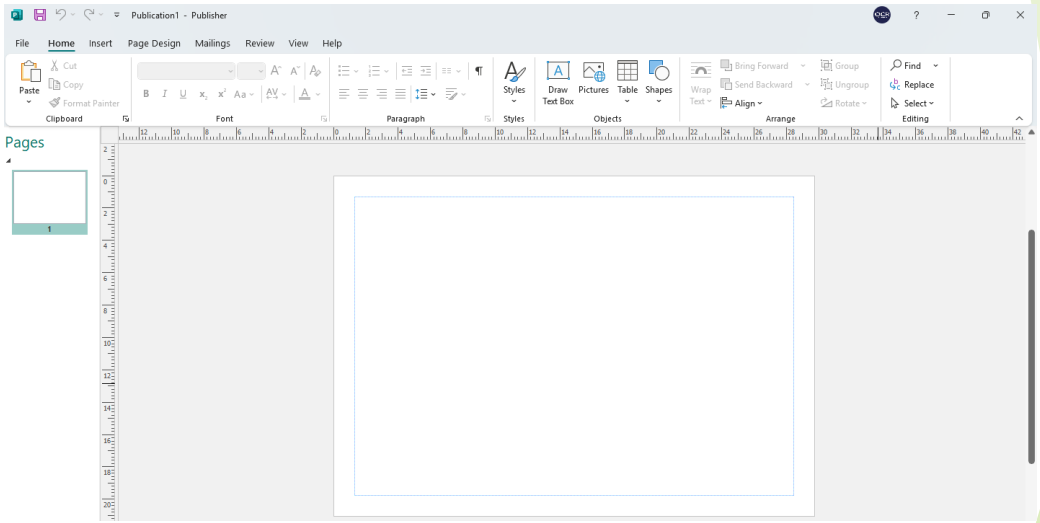
Rating: 8/10

Advantages:

- Provides a variety of templates that can be used alongside design tools.
- Easy to understand user interface – easy to learn and use in most everyday tasks.
- Allows for text and image integration.
- Can be saved into many formats or printed.
- Offers excellent data visualization.

Disadvantages:

- File size issue due to the quality of the file.
- Less control over layers.
- Compatibility issues as not many computers support Microsoft Publisher files.



Conclusion – Annotation Software

- In conclusion, I have decided to use Microsoft Publisher for my annotation software. This is because unlike Microsoft Word and Microsoft PowerPoint, it provides a variety of templates that can be used alongside design tools alongside an easy-to-understand user interface which is easy to learn and use in most everyday tasks. Microsoft Publisher allows for text and image integration and its files can be saved into many formats or printed alongside offering excellent data visualization. Although there were some disadvantages like file size issues and compatibility issues, this is common across all the types of annotation software so it would haven't changed really any factors of the software.

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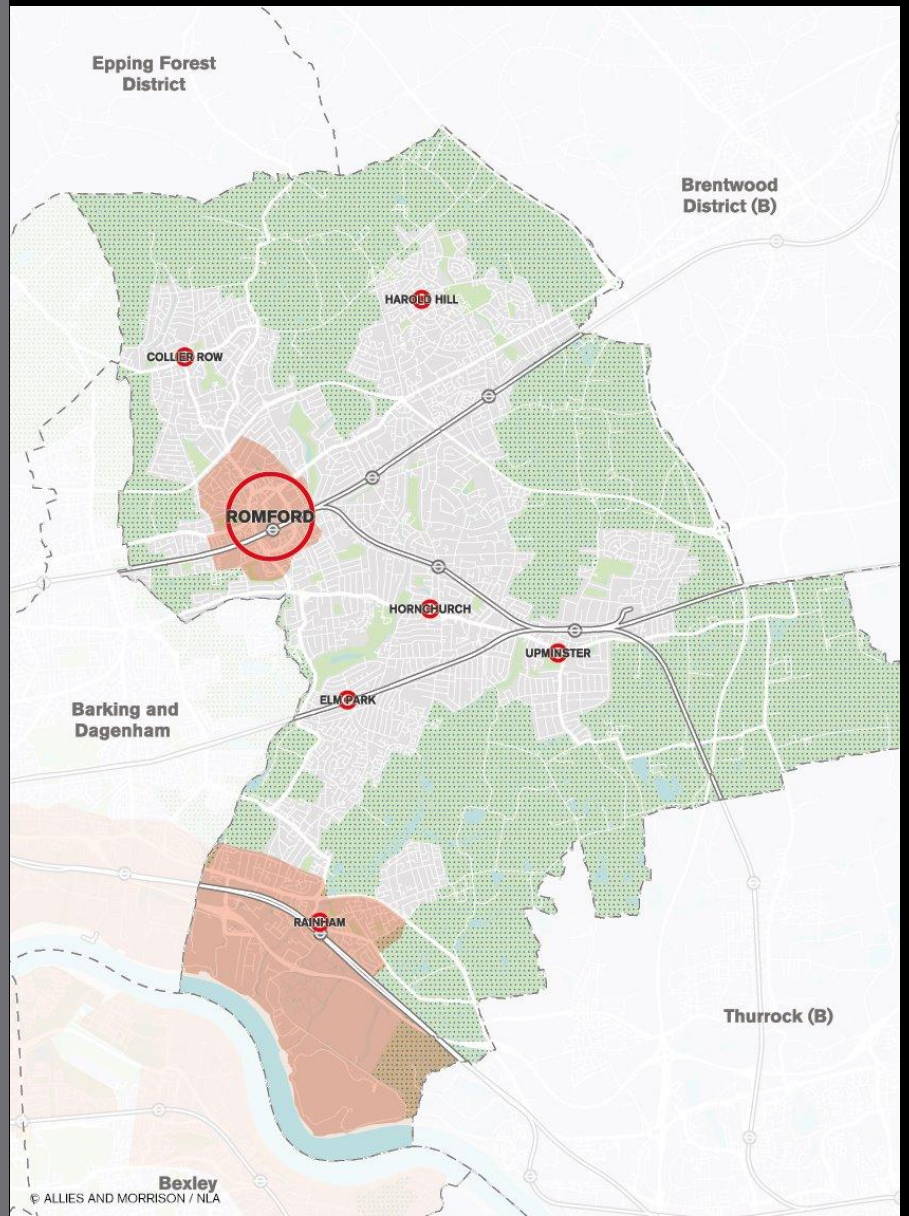


Do Havering residents feel isolated in terms of public transportation compared to other London boroughs and Essex?

EPQ Artefact – Skill Development and Producing An Artefact

What resources have decided to use for producing my artefact:

Linking back to my research portfolio on slides 6, 18 and 22, I have figured out what resources I required and will use for t he production of my artefact. I will be using:

- A computer that runs the Windows operating system (most preferably Windows 10 or Windows 11) because Windows has more support fo r many different applications and programs compared to that of Apple's Mac and this would be the main device I would be using t o make my designs and final artefact as without a computer I cannot create any digital design maps.

- Microsoft Paint 3D for my painting software because the software has an easy-to-understand and easy-to-use user interface compared to that of Adobe Photoshop as well as being free to use due to it being bundled with Windows 10. Although there was cons of using the software, such as the inability to weld and having a limited perspective, it was a better software to use compared to Microsoft Paint as tha t software can only do very basic editing capabilities as well as causing pixelation when resizing images. Microsoft Paint unlike Microsoft Paint 3D is also deprecated, which means that if bugs were found to be in the software they would be unable to be fixed due to the development of the software being stopped. This software also unlike Adobe Photoshop supports vector graphics which results in a higher quality design, while the latter software Adobe Photoshop does not and only supports bitmap graphics which results in a very pixelated design. If I did not have this specific painting software to edit the map with, I would not be able to directly show the specific route of my digital design map and would result in my design not being abstract.

- Ordnance Survey Map for my map software because it features the main town names of most of Havering as well as featuring area s where passengers can transfer to other services as well as public spaces. It also unlike Google Maps classifies the road type by co lor-coding, such as that main roads are red in color, other main roads are orange and yellow in color as well as normal streets being white in co lor unlike Google Maps which colored them all grey. This software meets my abstraction requirements as no unnecessary details such as advertise ments in Google Maps and unnecessary scenery such as Aerodromes in both Google Maps and OpenStreetMap. Although the software had some cons, such as certain town names like Hornchurch and Hacton not being shown which could result in residents in the area feel they a ren't getting an improved transportation service, it is better than both Google Maps and OpenStreetMap because these include unnecessary scene ry and don't mention most town names in their maps, which results in them not being abstract unlike the Ordnance Survey Map.

What area in Havering have I decided to use for producing my artefact:

Linking back to my project proposal form, I stated that in Section Three that I would use the research I found out about different locations in Havering to create designs of digital design maps that could be implemented in these areas to support the local community. I also stated that I would implement decomposition by breaking down each specific district within the London Borough of Havering and then base these smaller specific locations I found as the places where I should base these maps specifically on.

Also linking to my research portfolio, I found out about these specific areas from which I was able to use decomposition to break these district into smaller areas, such examples include Cathedral's Estate and Clay Tye Road in Cranham on Page 7, Aveley Road in Upminster on Page 8 and Hacton Lane in Hacton on Page 10.

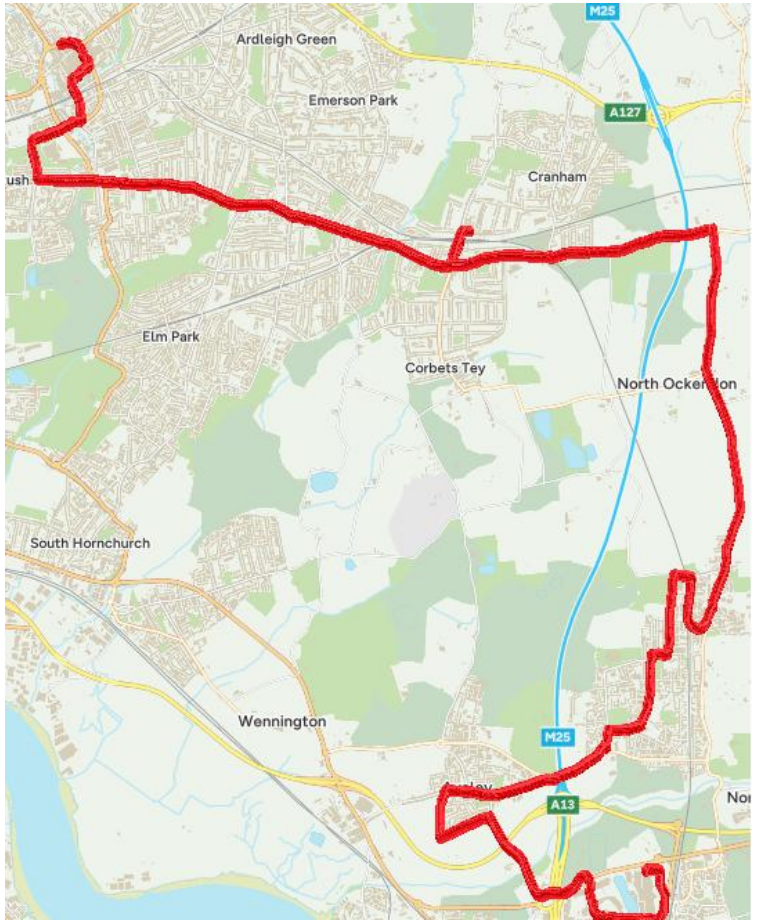
From these I have decided to use:

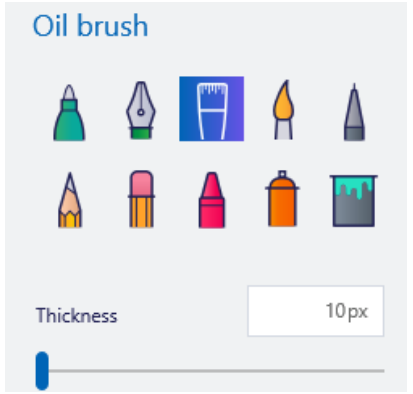
- Cathedral Estate and Clay Tye Road in Cranham because it was very recent evidence of Havering being isolated in terms of transportation.

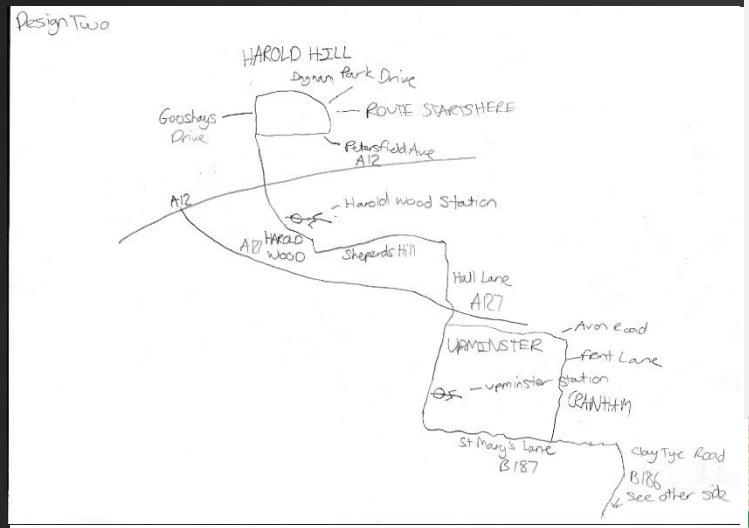
- Seeing as the service that operated down these two roads was Route 347 which was a bus route, I have decided to also do a bus service as considering the advantages and disadvantages of the other modes of transportation, a bus route makes more sense as they have less operational costs, reduce congestion and can be flexible in routing while if a trolleybus service was implemented they would have to slow down as they turn, are expensive and rerouting is usually not possible. This is the same case with trams, and they are harder to mix with other forms of transportation as they cannot go around obstacles and take up too much space. Trains would be in the same situation as trams as it would be considerably expensive to have to build a railway line to divert via Cranham Village and Cathedral Estate to Ockendon Station on the c2c from the current tracks at Upminster Station as well as being considerably costly to create a new train station between Upminster and Ockendon Stations. If the District Line tracks were used instead or the London Overground tracks, that would also be an issue as the Upminster depot may possibly need to be demolished and relocated so either one of the two could be extended to Cranham or North Ockendon as well as the costs of the new tracks and the new station building.

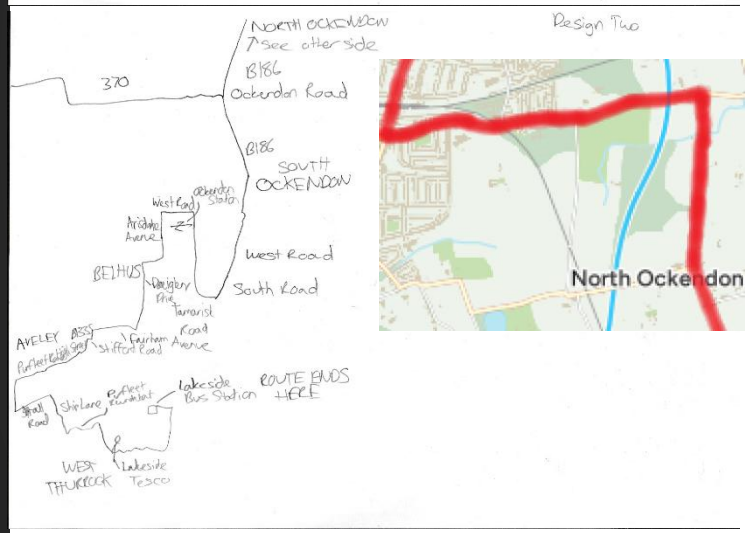
Skill Development - First Design

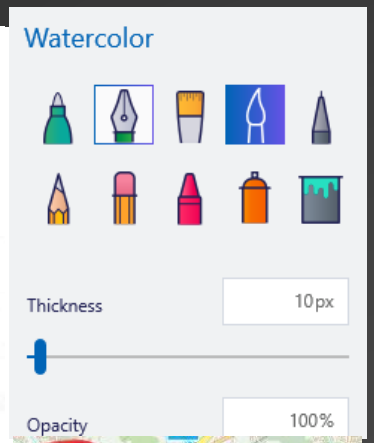
- For my first design, I thought I would choose a route that has already existed for my first design, which was Route 348 between Romford and Lakeside via Cranham, which I had already found out from previous research as I have also done research on this route in the past with my website.
- However, I slightly modified the route so that the route would also serve Rush Green along its way to Lakeside and unlike Route 347, it would serve Hornchurch Town Centre and Ockendon Station directly before going onto serve Belhus, Aveley, Lakeside Retail Park and Lakeside in neighboring Thurrock.
- For my first design in Paint 3D, I decided to start by using an oil brush as I wanted it to test the digital design map out, however I had found issues when using this method.
- First, the thickness of the actual paint line that the tool uses cannot be less than 10px (10 pixels) which with small lines, for example Upminster Station, can result in overly excessive painting.
- Also, upon zoomed in inspection, the paint is only more prominent in the middle of where you are painting a line, which means it has a very low opacity, which is an issue as I want the digital design maps paint to have an even opacity to it as otherwise it will create a color imbalance as shown in the close-up screen shot of North Ockendon.

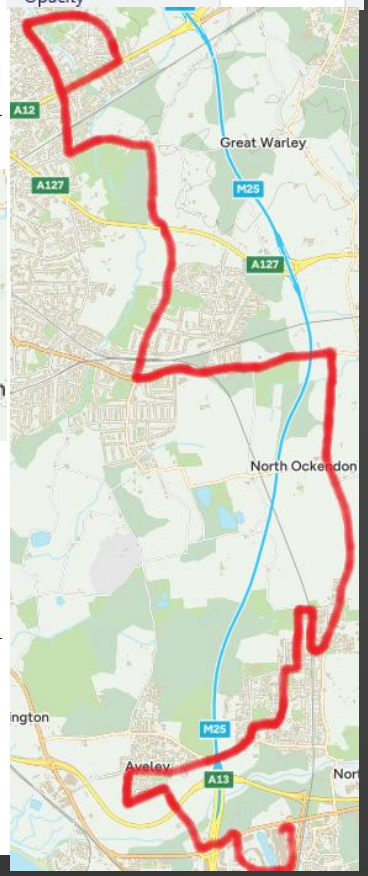






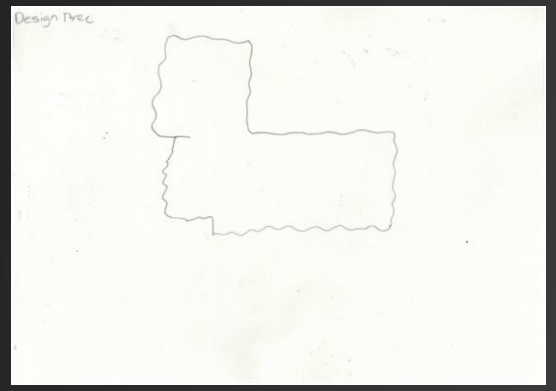


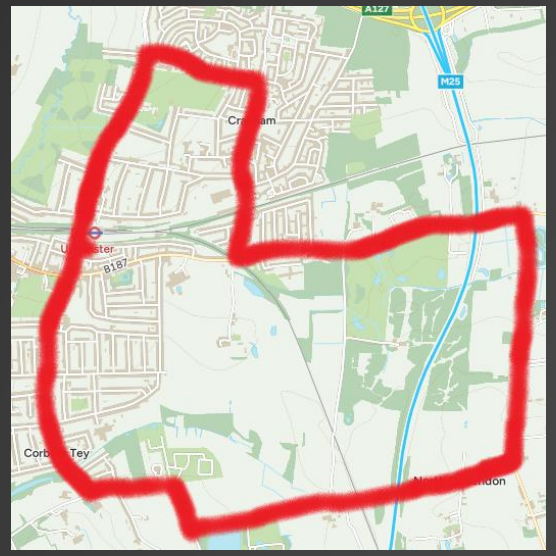


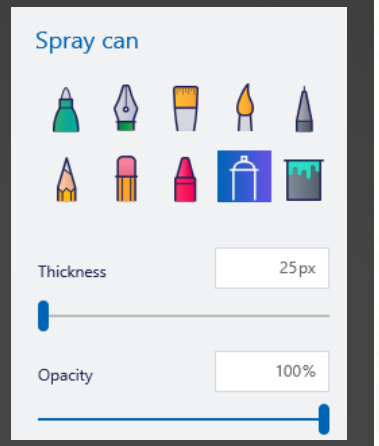


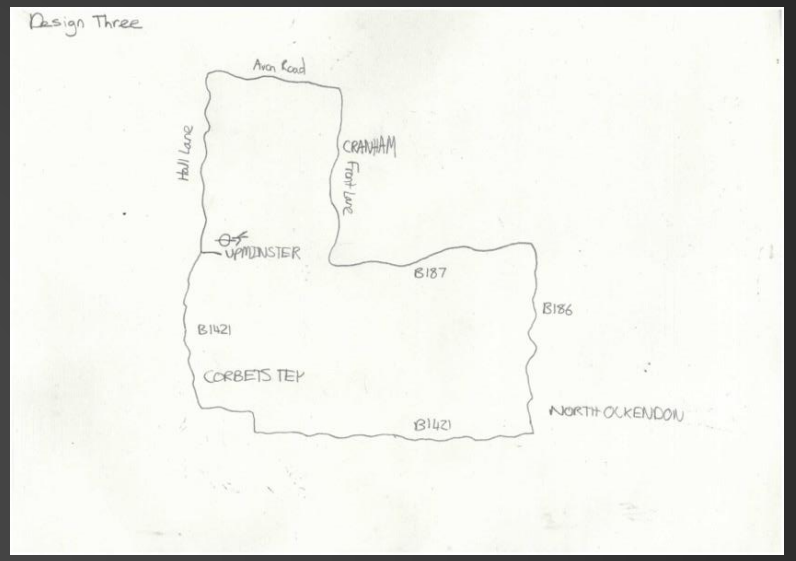
Skill Development - Second Design

- For my second design, I thought I would start by experimenting by first drawing out my route without any map software and from there plan the route using plain paper as well as labelling each part of the route as well as nearby routes and roads that would operate nearby my second design.
- I decided on settling for Harold Hill, Dagnam Park Drive and Lakeside for my second design as my main terminus and I was inspired by the design for Route 347 but altered in the Harold Wood section by making it go to Harold Hill instead of Romford and in the Ockendon section by extending it to Lakeside via the way of my first design.
- For the design in Paint 3D, I decided instead of using the spray paint function I would use watercolor instead for my second design just to try it out and use the spray paint tool for my next design to see how it looks.
- However, I noticed some issues while using this tool. Unlike the oil paint which has a fixed thickness of at least 10px, the watercolor tools thickness can be decreased to 5px. However, I noticed the opacity was once again off as parts of my design like the previous design either were prominent or very faded which makes me believe that the opacity on the watercolor tool must not work properly. This can clearly be seen on the zoomed in screenshot I took at North Ockendon on the map as it fades at certain parts and at other parts it doesn't, which directly shows that it has a color imbalance and therefore an opacity imbalance.



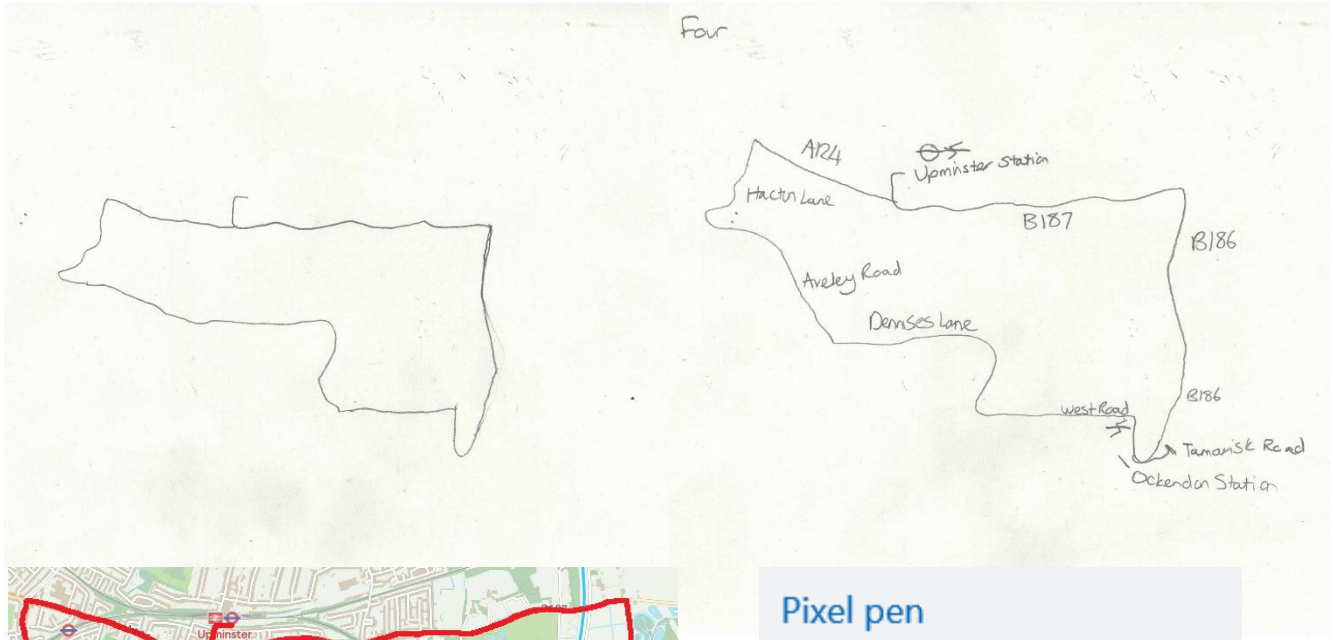


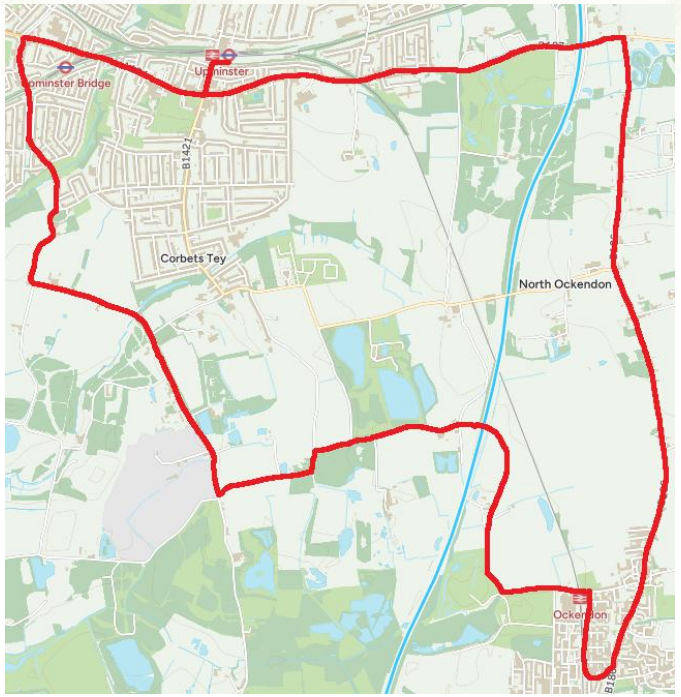


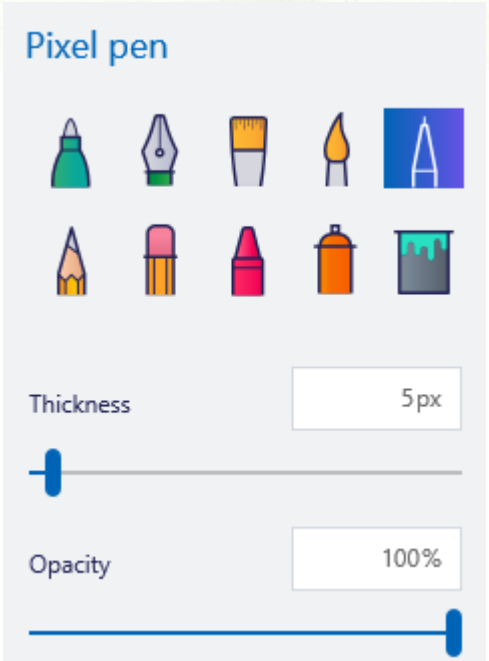


Skill Development - Third Design

- For my third design, I thought I would experiment with the use of transverse waves in my designs as they represent how some roads look like in Upminster and Cranham almost realistically, especially on St Mary's Lane on the B187. I created two versions of the design, one annotated later and the first version non-annotated.
- However, I found issues while drawing this design with transverse waves. The issues with this is that transverse waves do not accurately represent all the roads within these areas e.g., Front Lane and the B186. As well as this, the transverse waves are too curly, which result in some roads looking like they either directly connect with each other or very bendy when they are not.
- For my design in Paint 3D, I used the spray can tool to create my third design like I said I would in my activity log.
- However, I ran into some issues when I was using the spray can tool. Firstly, the thickness can't be set lower than 25px which results in accuracy errors when drawing small lines as seen at Upminster Station. Secondly, there is also parts of the spray paint which does not represent parts of the roads which makes my map seem inaccurate as it doesn't truly reflect the shapes of the actual road as it makes them appear bigger.

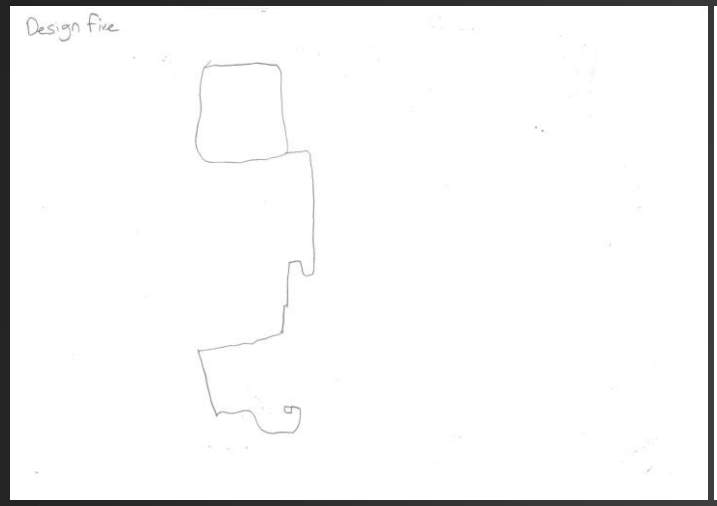


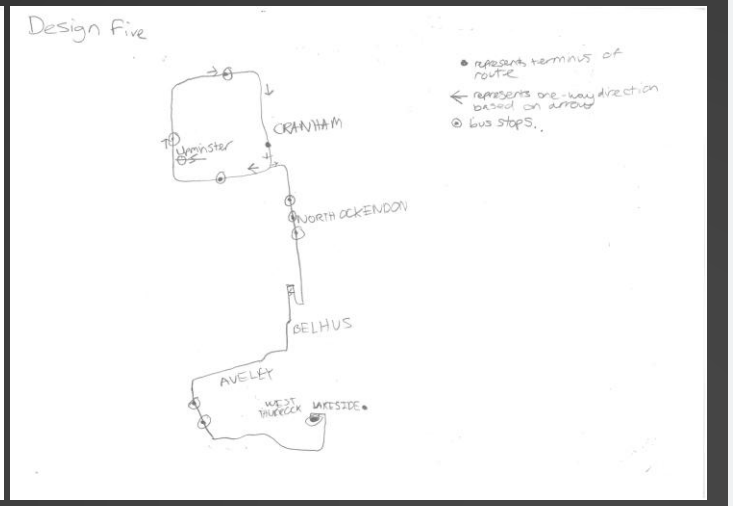


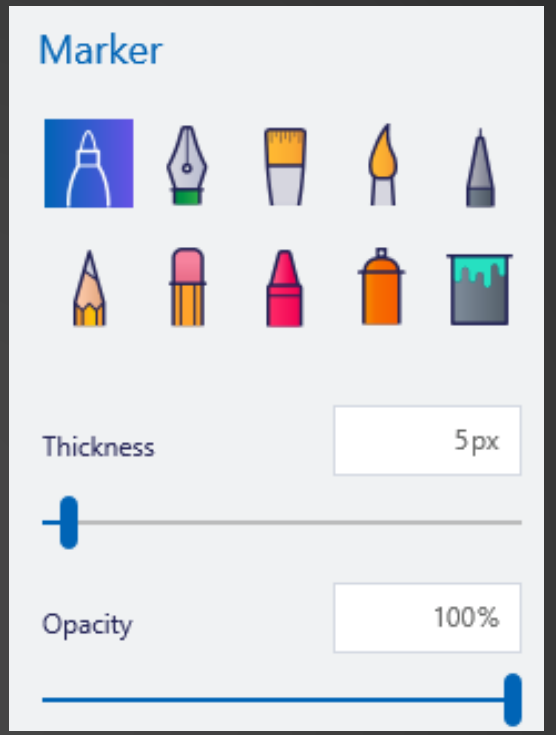


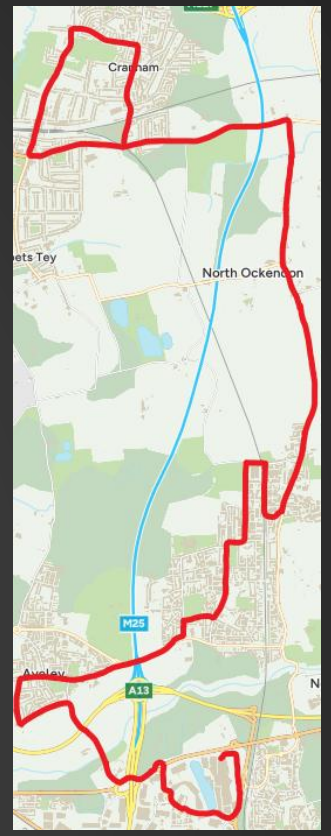
Skill Development - Fourth Design

- For my fourth design, I thought like my third design I would create two versions of the design, one annotated later and the first version non-annotated. I inspired this design from part of the Thames Weald service in the Hacton area as well as Route 347 and 373 which I had documented in my research.
- I then proceeded to make the design in Paint 3D using the Pixel pen tool and I am planning on using this tool possibly as the tool for the final design.
- This is because the thickness of the Pixel pen can be as low as 1px while other tools I had used cannot be lower than either 10px or 25px. As well as this, the tool has a great opacity compared to all of the other tools I have used so far as it doesn't have a color imbalance or only prominent paint in the middle of the line.
- The only issue to the Pixel pen is that it looks pixelated when zoomed in but that is to be expected as it is supposed to seem pixelated as obvious by the name of the tool.
- I plan on doing one more design and from there choosing the final tool I will use for the creation of my final artefact.







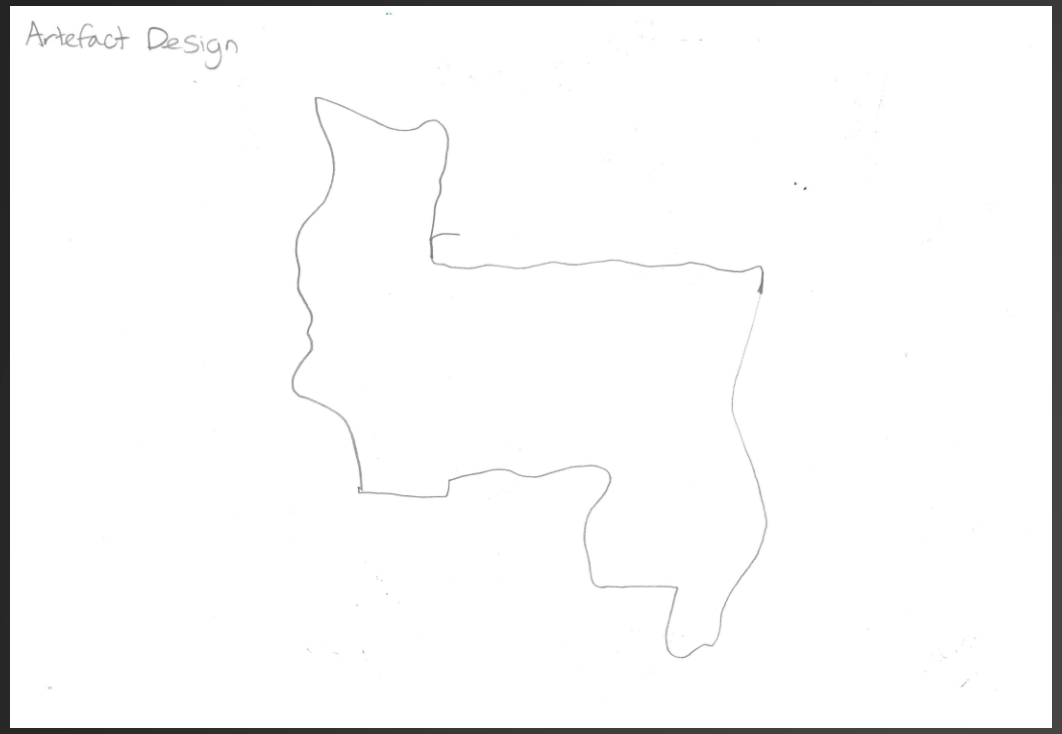


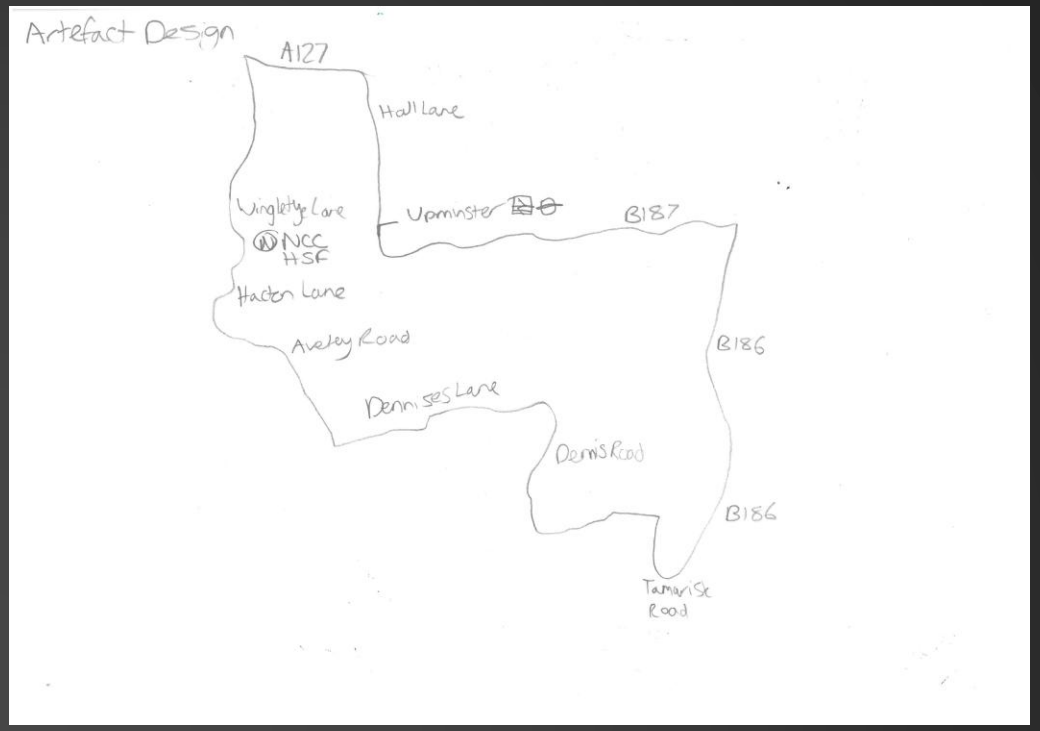
Skill Development - Final Design

- For my fifth design, I was inspired by my third and fourth to create my original paper design with first no annotations before creating one that had annotations.
- I decided to take inspiration from Transport for London Bus spider maps to create a more abstract design before doing a geographical inspired map based on the design. I took inspiration from my Third Design where I used Cranham as one of my designs as well as designs one and two which both went to Lakeside.
- I proceeded to make the design in Paint 3D using the Marker tool and I am perhaps planning on using this tool as the tool for the final artefact.
- Like the pixel pen, the thickness can be decreased to 1px thickness, and the opacity of the marker is great as well which results in no color imbalance and no opacity imbalance.
- However, I noticed unlike the pixel pen that was very pixelated when drawing, the marker has a very great bit quality which results in a higher-quality image.
- I did not encounter any disadvantages with using this tool and so this may be my solution for the tool I will use to make my final artefact.

Skill Development - Conclusion

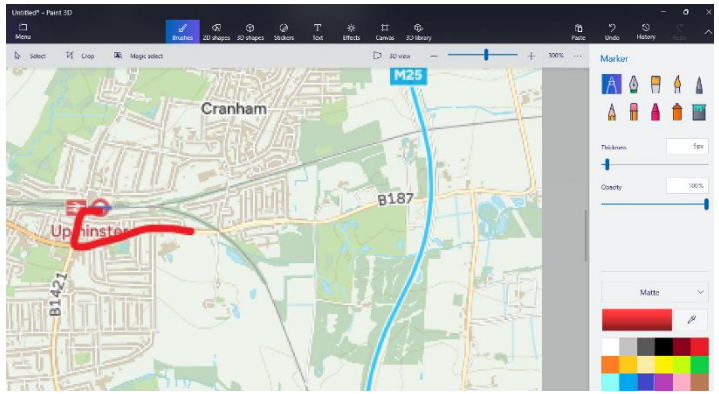
- From my skill development, I have successfully been able to test various tools on the Microsoft Paint 3D software and have been able to successfully narrow the list of tools I want to use for my final artefact down to two tools, the Marker and the Pixel pen. This is because both tools have a great opacity which makes colour imbalance impossible, as well as preventing opacity imbalance. However, due to the Pixel pen having pixelation while drawing designs, I have decided to use the Marker as my tool for my final artefact.
- Considering how all my designs went, and how I was considering using either design four or design five for my final artefact because they seem the most abstract compared to the others, I will be using design four as inspiration for my final artefact.

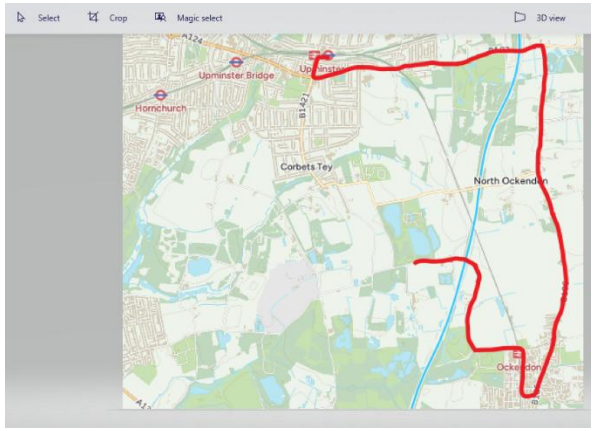


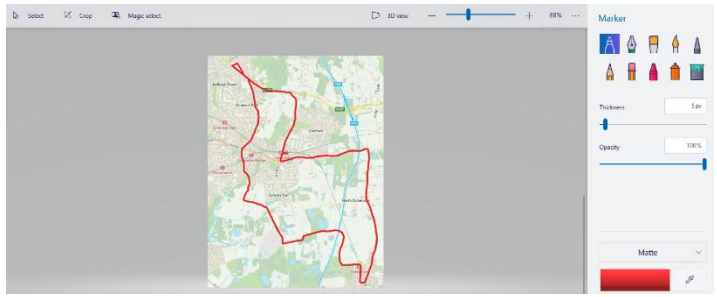


Artefact – Producing An Artefact (The Design)

- For my artefact, I was inspired by my third, fourth and fifth design to create my original paper design with first no annotations before creating one that had annotations.
- I decided to take inspiration from my fourth design which looked almost like a triangle to create this final design, and instead of going via Upminster Bridge to Upminster I settled on letting it go via Wingletye Lane and the A127 to Ardleigh Green. I later decided to also add some new elements such as the addition of going through some very small roads in Ardleigh Green to turn around and head back to Upminster via the A127 towards Ockendon.







Artefact – Producing An Artefact (The Production)

- During the production of my artefact between February 7th and February 27th, I started by first creating the first part of my artefact using the Marker tool as shown in the third photo and then set the thickness to 5px and the opacity to 100% and I did this on February 8th. This is shown in the first photograph.
- I decided to take screenshots at the start of the development of the design, the middle of the development of the design and the end of the development of the design.
- As shown in the second photo, I reached mid development by half term which occurred on February 14th and had created half of the design which reminded me of my one of my designs for my skill development.
- Then on February 27th, I finished my artefact fully as shown in the third photo.

Final Artefact without Annotations

Your new route 848 nicknamed The Haverloop begins service on Friday, April 4th 2025.

Where it goes

848 Your new timetable

848 Ardleigh Green - Upminster - Ockendon - Hacton - Ardleigh Green

Monday to Saturday

Ardleigh Green *Redden Court Road*	0700	0815	0930	1115	1310	1509	1705	1810	2030
Upminster *Hall Lane*	0708	0823	0938	1123	1318	1517	1713	1818	2038
Upminster Station	0713	0828	0943	1128	1323	1522	1718	1823	2043
North Ockendon *White Horse*	0723	0838	0953	1138	1333	1532	1728	1833	2053
Ockendon Station	0728	0843	0958	1143	1338	1537	1733	1838	2058
Aveley Road *White Post Wood*	0736	0851	1006	1151	1346	1543	1741	1846	2106
Hornchurch *Hacton Lane Estate*	0741	0856	1011	1156	1351	1548	1746	1851	2111
New City College *Havering Sixth Form*	0743	0858	1013	1158	1353	1550	1748	1853	2113
Southend Arterial Road	0752	0907	1022	1207	1402	1559	1757	1902	2121
Ardleigh Green *Ardleigh Green Road*	0753	0908	1023	1208	1403	1600	1758	1903	2122
Ardleigh Green *Redden Court Road*	0755	0910	1025	1210	1405	1602	1800	1905	2124

848 Ardleigh Green - Upminster - Ockendon - Hacton - Ardleigh Green

Sundays and Bank Holidays

Ardleigh Green *Redden Court Road*	0930	1115	1310	1509	1705	1810
Upminster *Hall Lane*	0938	1123	1318	1517	1713	1818
Upminster Station	0943	1128	1323	1522	1718	1823
North Ockendon *White Horse*	0953	1138	1333	1532	1728	1833
Ockendon Station	0958	1143	1338	1537	1733	1838
Aveley Road *White Post Wood*	1006	1151	1346	1543	1741	1846
Hornchurch *Hacton Lane Estate*	1011	1156	1351	1548	1746	1851
New City College *Havering Sixth Form*	1013	1158	1353	1550	1748	1853
Southend Arterial Road	1022	1207	1402	1559	1757	1902
Ardleigh Green *Ardleigh Green Road*	1023	1208	1403	1600	1758	1903
Ardleigh Green *Redden Court Road*	1025	1210	1405	1602	1800	1905

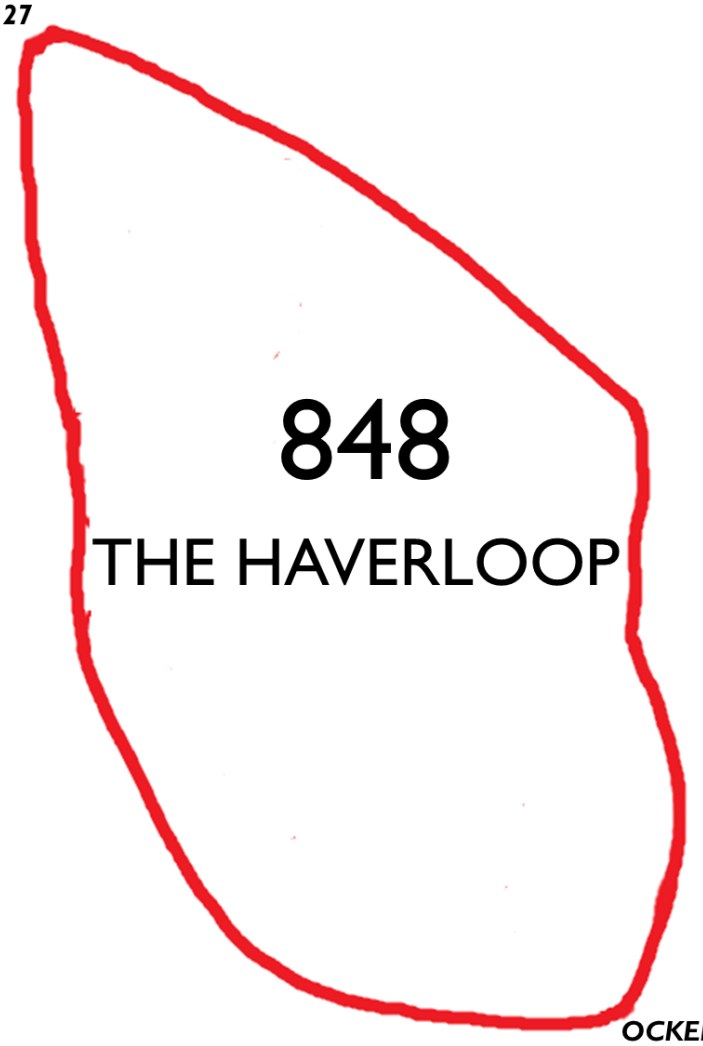
Final Artefact with Annotations

848

Your new route 848 nicknamed The Haverloop begins service on Friday, April 4th 2025.

ARDLEIGH GREEN

A127



OCKENDON

Where it goes

Your new timetable

848 Ardleigh Green - Upminster - Ockendon - Hacton - Ardleigh Green

Monday to Saturday

Ardleigh Green *Redden Court Road*	0700	0815	0930	1115	1310	1509	1705	1810	2030
Upminster *Hall Lane*	0708	0823	0938	1123	1318	1517	1713	1818	2038
Upminster Station	0713	0828	0943	1128	1323	1522	1718	1823	2043
North Ockendon *White Horse*	0723	0838	0953	1138	1333	1532	1728	1833	2053
Ockendon Station	0728	0843	0958	1143	1338	1537	1733	1838	2058
Aveley Road *White Post Wood*	0736	0851	1006	1151	1346	1543	1741	1846	2106
Hornchurch *Hacton Lane Estate*	0741	0856	1011	1156	1351	1548	1746	1851	2111
New City College *Havering Sixth Form*	0743	0858	1013	1158	1353	1550	1748	1853	2113
Southend Arterial Road	0752	0907	1022	1207	1402	1559	1757	1902	2121
Ardleigh Green *Ardleigh Green Road*	0753	0908	1023	1208	1403	1600	1758	1903	2122
Ardleigh Green *Redden Court Road*	0755	0910	1025	1210	1405	1602	1800	1905	2124

848 Ardleigh Green - Upminster - Ockendon - Hacton - Ardleigh Green

Sundays and Bank Holidays

Ardleigh Green *Redden Court Road*	0930	1115	1310	1509	1705	1810
Upminster *Hall Lane*	0938	1123	1318	1517	1713	1818
Upminster Station	0943	1128	1323	1522	1718	1823
North Ockendon *White Horse*	0953	1138	1333	1532	1728	1833
Ockendon Station	0958	1143	1338	1537	1733	1838
Aveley Road *White Post Wood*	1006	1151	1346	1543	1741	1846
Hornchurch *Hacton Lane Estate*	1011	1156	1351	1548	1746	1851
New City College *Havering Sixth Form*	1013	1158	1353	1550	1748	1853
Southend Arterial Road	1022	1207	1402	1559	1757	1902
Ardleigh Green *Ardleigh Green Road*	1023	1208	1403	1600	1758	1903
Ardleigh Green *Redden Court Road*	1025	1210	1405	1602	1800	1905

Be able to present project outcomes and an evaluation to an audience

A succinct summary of the main features of your artefact

The main features of my artefact include an abstract design on the first page of my publisher file of the route in the shape of an oval with the main destinations included being Ardleigh Green (A127) in the north and Ockendon in the south.

On the second page, I have included an abstract digital design map which meets my project proposal form as it only includes the main roads that it serves in the areas. I also included the main towns from which I showed local connections from which people can transfer to from this route.

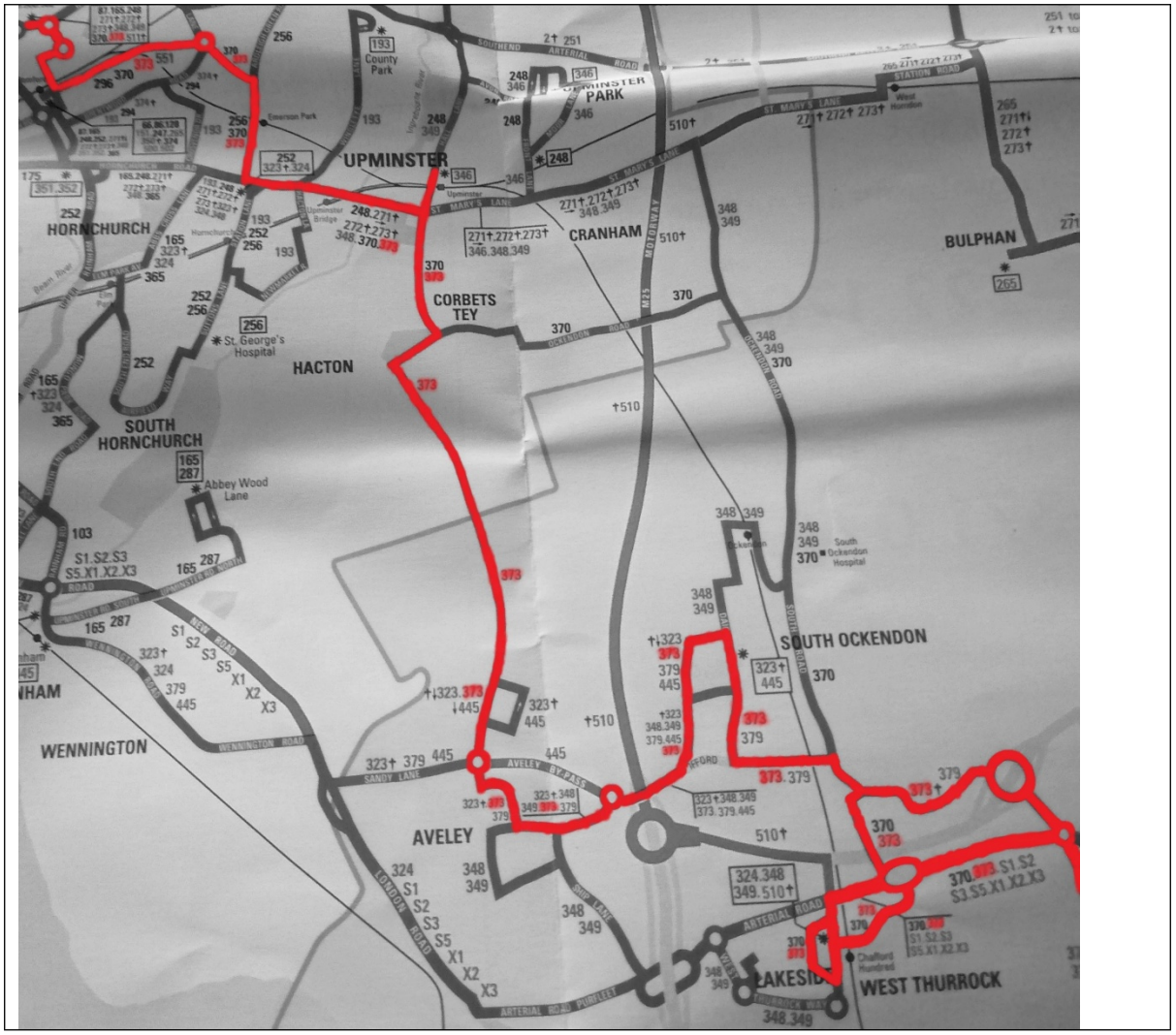
On the third page, I have included a timetable of the route that I have created which shows that I have met my skills of decomposition as I have identified areas within the local community which are suffering with very poor transportation. This includes a Monday to Saturday service, alongside a Sunday to Bank Holiday service.

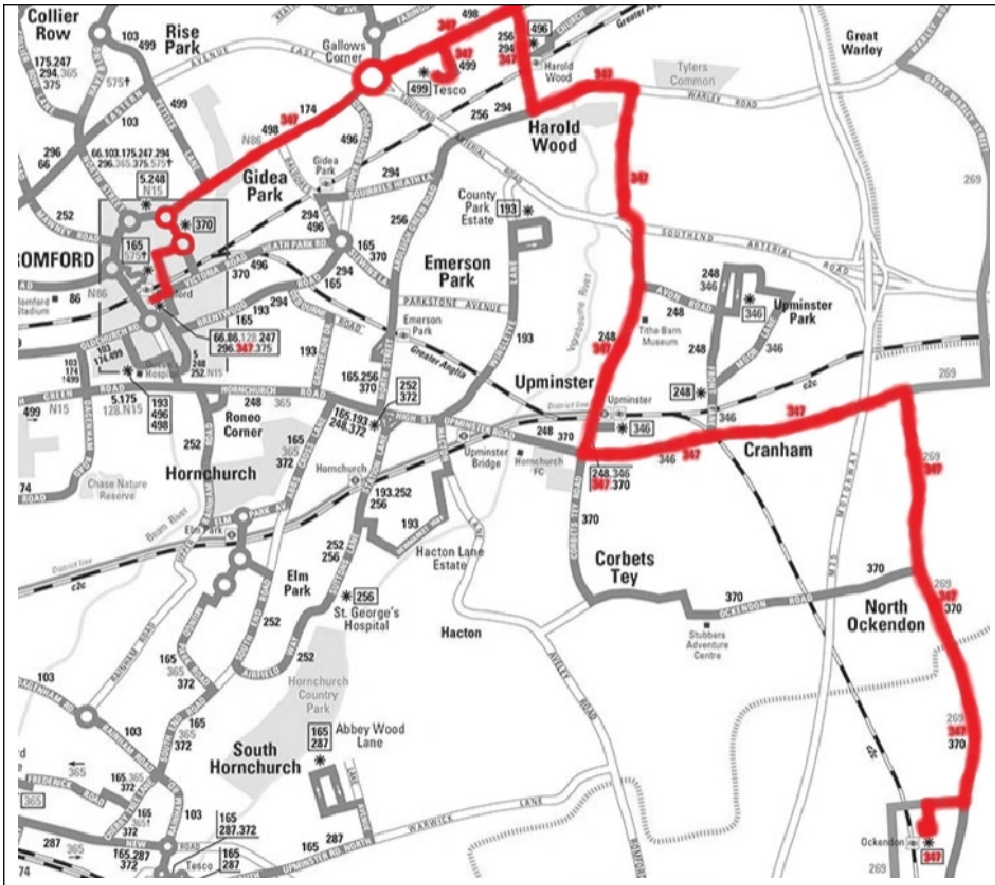
The extent to which you achieved what you set out to achieve

I believe that I was able to successfully achieve everything that I set out to achieve.

I was able to come up with a proposal for my original project and I decided on something related to transportation in London, in this case I decided on the London Borough of Havering as this is the borough that I go to sixth form in everyday and I noticed that there is very poor transportation in this borough compared to many other boroughs in the local area. Originally, my idea was that I was going to take photographs of areas where I believed they were isolated, but I later decided on doing a digital design map because I thought that would be a much more manageable goal.

As for my research, I was able to research possible methods of transportation that could be used for my final artefact while weighing up the pros and cons of each different method alongside researching some of the failures that have occurred during the rule of Transport for London (TfL) since 2000 (Route 347, Route 373) and the reasons why residents in this area feel isolated. I also researched different available map programs, annotation software and painting software to create my final artefact.


UPMINSTER
UPMINSTER PARK
CRANHAM
BULPHAN
HORNCHURCH
HACTON
CORBETS TEY
SOUTH HORNCHURCH
SOUTH OCKENDON
WENNINGTON
AVELEY
WEST THURROCK
LAKESIDE
County Park
St. George's Hospital
Abbey Wood Lane
South Ockendon Hospital
Chafford Hundred
SOUTHEND ARTERIAL ROAD
ST MARY'S LANE
OCKENDON ROAD
WENNINGTON ROAD
SANDY LANE
AVELEY BY-PASS
LONDON ROAD
ARTERIAL ROAD
M25 MOTORWAY



As for my skill development, I was able to justify the resources I would use for my artefact, alongside what area within Havering I would specifically be focusing on. I also wrote about each of my designs regarding the tools in the paint program I had used alongside when I drew my original designs and the issues and positives with each of these tools.

I was able to create a digital design map that was abstract within the set time that I had given myself which was until the 4th of March 2025.

How well the artefact meets the original brief

My artefact meets my original brief to a very high standard, as it implements abstraction which I discussed in original brief that I wanted to implement in my final artefact to sort of link over to my other subjects (in this case A Level Computer Science) alongside features of decomposition by identifying key areas where my artefact would mainly be based which I decided would be roads of Clay Tye Road and St Mary's Lane in Upminster. I successfully annotated my designs to show the major roads that my route travels along as well as the other connections that the service will link to in the form of railway stations.

How well you managed at the different stages of the project

I believe I was able to manage quite successfully at being a project manager overall as I was able to meet most of the deadlines that I had set myself across the time from November to April however sometimes needed to extend my deadlines in the case of my research, skill development and during the production of my artefact but however this was to ensure that my research would be of a higher quality with more different points being a part of this, while also making my skill development designs more like the final artefact and ensuring that I have enough time to complete my final artefact. I did sometimes lose focus during my development process but however I was able to mainly mitigate this by researching articles which linked over to my project that were also part of my lost focus and would work in the research portfolio.

What you would do differently next time and why

The things that I believe I would do differently next time is ensure that I have enough time to meet my deadlines on the first occasion so that way I do not have to worry about a knock-on effect onto other parts of the project and then I get the full amount of time that is required of me for my project. I would also ensure that I was able to get more primary research instead of heavily relying on secondary sources to back up my project so that I have exact sources of how the community around me feels.

What you have learned about producing an artefact and how useful this has been to you

I have learnt that when producing an artefact, you must put a lot of time and effort into carrying out the research and skills required to create your final product alongside the development of these skills before you can make your final artefact. This would therefore ensure that your final artefact is of a high quality and meet your final deadlines for actual projects which you may work on later in life. This has been useful to me as it has shown to me that I am able to demonstrate my independence as a project manager and that I am able to take responsibility for what goes on during the production of my artefact and therefore has developed my skills of being independent.

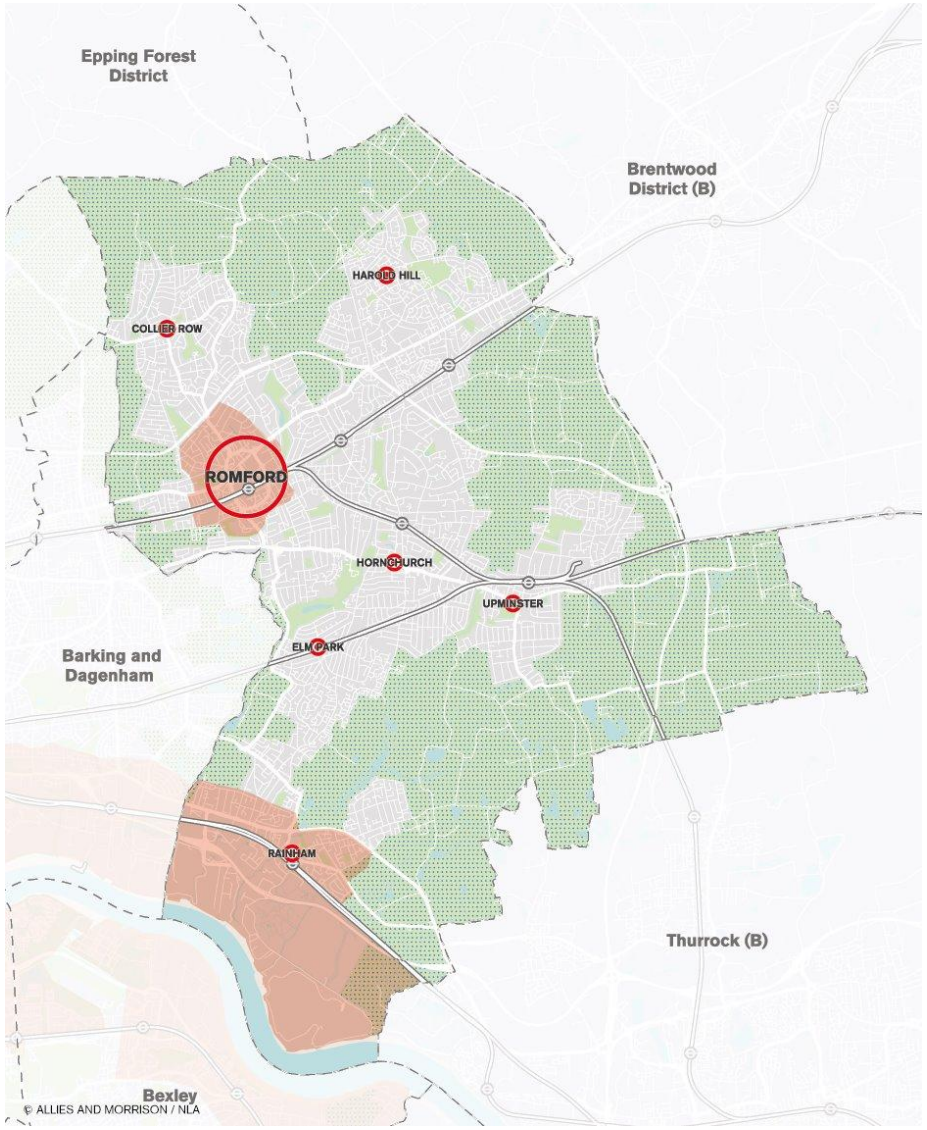
Do Havering residents feel isolated in terms of public transportation compared to other London boroughs and Essex?
EPQ Artefact - Presentation

Transportation in Havering

- Does anyone here live in Havering?
- Have you heard about any recent withdrawals in the London Borough of Havering regarding transportation?
- Does anyone in the room know about or experienced the lack of transportation in Havering?

The extent to which I achieved what I set out to achieve

- I believe that I was able to successfully achieve everything that I set out to achieve.
- I was able to come up with a proposal for my original project and I decided on something related to transportation in London, in this case I decided on the London Borough of Havering as I noticed that there is very poor transportation in this borough compared to many other boroughs in the local area.
- Originally, my idea was that I was going to take photographs of areas where I believed they were isolated, but I later decided on doing a digital design map because I thought that would be a much more impactful goal.
- As for my research, I was able to research possible methods of transportation that could be used for my final artefact while weighing up the pros and cons of each different method alongside researching some of the failures that have occurred during the rule of Transport for London (TfL) since 2000 (Route 347, Route 373) and the reasons why residents in this area feel isolated. I also researched different available map programs, annotation software and painting software to create my final artefact.
- I also looked at different techniques and tools that I could use in the specific annotation software and painting software and then analysed how several different tools in Paint 3D worked during my skill development.



Research Screenshots

- Here is some examples of my research that I carried out, some regarding looking at a specific withdrawal in the area while others were about the software I would use or the previous artefacts that have existed to solve the problem.

Upminster and Corbets Tey - Route 373[10]

Available from: https://www.london.gov.uk/who-we-are/what-london-assembly-does/questions-mayor/find-an-answer/373-bus-route-0[10a]
https://essexbuschronicles.fandom.com/wiki/London_Buses_route_373[10b]

Author:
The first source from the Mayor of London's website, which provides answers to the London Mayor's Question times. The second source is from my own previous research I have done on this specific route which would classify it as both a primary and secondary source.

Reliability:
The first article is reliable as it references the specific date and time that the question was asked which was on February 20, 2008, between 10:00 to 13:00.
It was asked by Richard Barnes who is a part of City Hall Conservatives to the Mayor and has links to all of these individuals and their organizations. It also has a reference number for each individual question and provides both the original question asked and the answer provided from the Mayor.

Meanwhile, the second article is reliable as it tells who edits the article every time a change is made and the original creation date, and it is the same individual each time (me) and also uses secondary sources that the person owns (me). The person (me) also specifically edits the article to include each specific day that an event occurred and documents the entire history of this specific route.

Key notes from the articles:

In the first article, it was stated by the Mayor that Route 373 operated as a commercial service between Upminster and Grays by Arriva at this specific moment in time and that most of the route is in Thurrock (Aveley, Belhus, Lakeside, North Stifford and Grays). The route operated under a London Local Service Agreement (LLSA) and so therefore was not a London Buses contract. Although it was mentioned that Routes 347, 370 and 372 would partially replace the withdrawn route, a small section of this route between Corbets Tey and Aveley, which the question mentions as Aveley Road, would not be covered by alternative services due to only 20 trips per day occurring in this area. It was then said to be unjustifiable to offer a service on this basis. The question was written with the concern that the withdrawal of this route would result in people living on Aveley Road, Harwood Hall Lane and part of Romford Road in Havering without a bus service, and as Aveley Road has no pavement, it makes it impossible to walk up the road alongside heavy volumes of traffic on the road.

In the second article written by me, it mentions that Route 373 originally was introduced in 1975 as a Rainham-Grays service replacing withdrawn London Country service Route 371, but it wasn't until 1987 that the route went to Romford. It then ran between Romford and Tilbury Docks as a albeit indentical route to Route 370 except via Aveley and Belhus, however, was soon withdrawn back to Grays from Tilbury soon after being extended to Romford. It was then rerouted on October 25, 1990, to serve the new Lakeside Shopping Centre when it opened. On September 14, 1991, the Rainham to Grays limited-service section was withdrawn and replaced partially by new Route 323. On October 10, 1998, it replaced the Belhus section of Route 323 and the Aveley section of Route 348 which was made an express service between Belhus and Lakeside. On April 28, 2007, after costs from accepting TfL passes and fares, the route was restructured and so was withdrawn between Romford Market and Upminster Station and this section was replaced by Route 370. However, the restructuring was not a success as by March 30, 2008, the route was withdrawn perhaps due to the loss of connection to Romford and so later the same day was replaced by Ensignbus route 22 between Upminster and Grays.

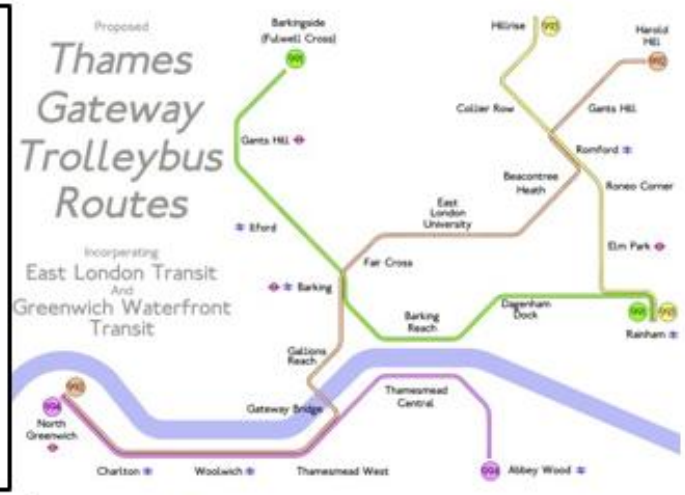
To the right is a 1998 London bus map attached which has been edited by me to show Route 373.

Previous artefacts/works designed to solve the problem:

East London Transit[16]:
Proposed by the Electric T-Bus group in 2001 as a cost-efficient way of getting patronage and supplying public transportation to not only Havering but many other local London boroughs and would be using trolleybuses in forms of several routes running as far as Collier Row, Ilford and Harold Hill to North Greenwich and Rainham.

Advantages:
The map depicts the areas of which places would be served and any connections which can be transferred to e.g. National Rail and the London Underground.
It gives each route a different colour in the style of the London Tube Map and simplifies the design of the routes.

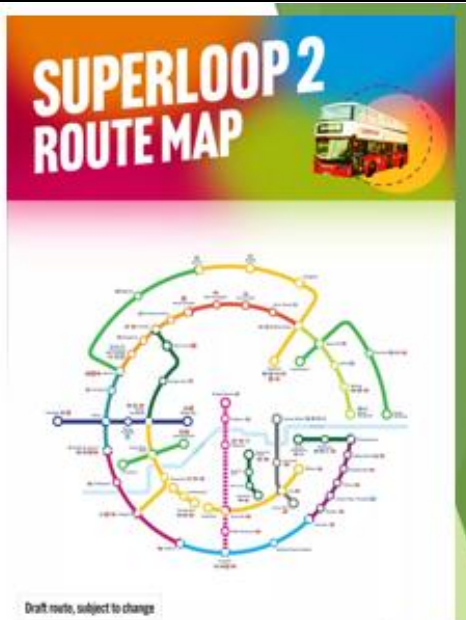
Disadvantages:
It mentions names of areas which aren't necessarily town names and aren't as important as they aren't supposed to be stops on this line e.g. Roneo Corner on Route 993 and East London University and Gateway Bridge on Route 992 which makes it less abstract.



Northern-Southern monorail link[17]:
Proposed in 2023 by Ray Morgon, the leader of Havering Council, to introduce a link across the Northern-Southern districts of Havering in the possible form of a tramway, light rail, bus or "monorail". It was estimated to cost "almost £200,000" to complete but would link Harold Hill/Collier Row to Rainham/Beam Park via Romford and Emerson Park or Upminster.
The main reason this was proposed was because many employers throughout the borough complained that they could not get workers successfully to work due to a lack of transport infrastructure.

Advantages:
The map depicts areas where current transportation links are avaliable as well as possible ideas to get new transportation links to the area.

Disadvantages:
Not very user-friendly as it doesn't separate National Rail stations from London Underground stations and doesn't exactly show how improvements may be carried out on the buses.
Not abstract because it includes locations which aren't necessarily important to Havering including Stansted and London City Airport. It also doesn't exactly explain how a monorail would be carried out as it features existing railway lines.



Superloop 2[18]:
Proposed by the Mayor of London, Sadiq Khan back on May 2, 2024, it was to introduce completely new ideas for Superloop routes and increase the total amount of routes from 10 to 20. There would be two brand new routes, one from Leytonstone to South Havering and one from Stratford to Barnet.

Advantages:
The map depicts the areas of which places would be served and any connections which can be transferred to e.g. National Rail and the London Underground.
It gives each route a different colour in the style of the London Tube Map and simplifies the design of the routes.

Disadvantages:
It doesn't exactly strictly mention town names that are served e.g. South Havering which could apply to South Hornchurch, Rainham or Wennington and possibly Hacton.
Doesn't show all connections to transportation on the map e.g. in Leytonstone which is connected to the Central line nothing is shown to display there is a connection link there.
It isn't exactly abstract as it displays places like Queen's Mary Hospital which aren't towns nor have any relevance to the transportation network.

Comparisons of paint software available that I possibly want to use:

- Microsoft Paint 3D

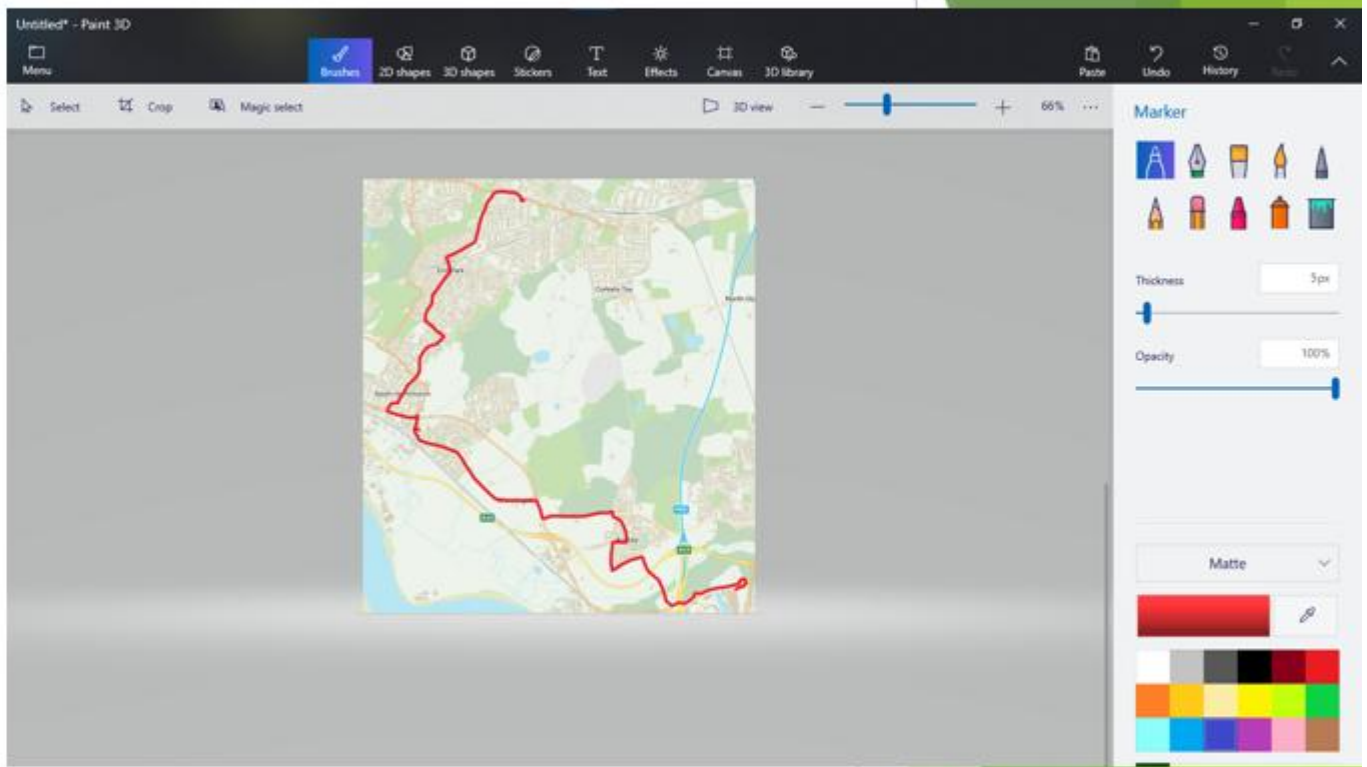
Rating: 8/10

Advantages:

- User friendly interface that is easy to understand.
- Ability to add both 2D and 3D shapes to the design map.
- Ability to add specific lighting effects to the design.
- Ability to easily edit the size of the canvas and photo.
- Free to use - comes bundled with Windows 10.

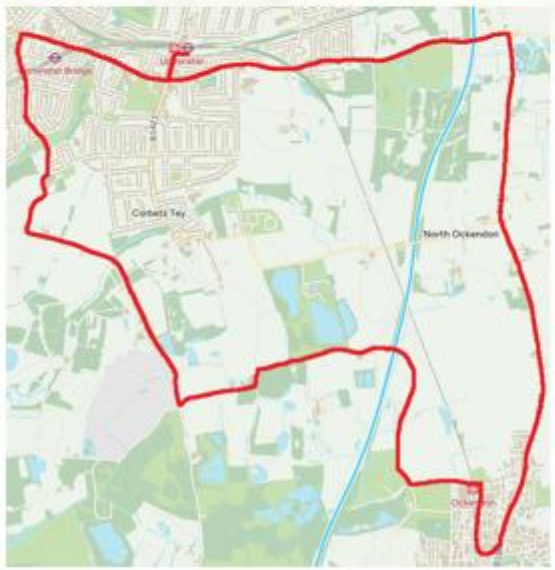
Disadvantages:

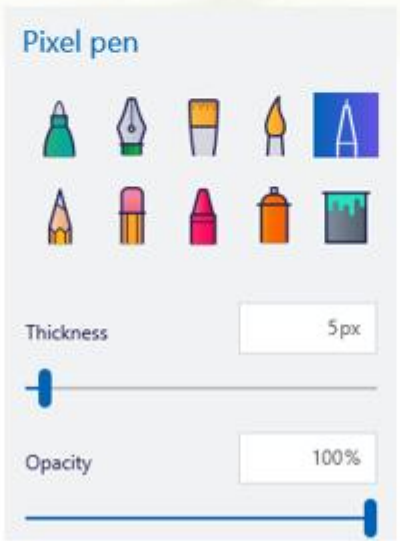
- Lack of scale - difficult to create models without a sense of size/ratio.
- Limited perspective - can only edit the model from one direction.
- No welding/joining - can't create more complex designs and therefore cannot do laying unlike Photoshop.



The extent to which I achieved what I set out to achieve

- As for my skill development, I was able to justify the resources I would use for my artefact, alongside what area within Havering I would specifically be focusing on. I also wrote about each of my designs regarding the tools in the paint program I had used alongside when I drew my original designs and the issues and positives with each of these tools.
- I was able to create a digital design map that was abstract within the set time that I had given myself which was until the 4th of March 2025.





Skill Development - Fourth Design

- For my fourth design, I thought like my third design I would create two versions of the design, one annotated later and the first version non-annotated. I inspired this design from part of the Thames Weald service in the Hacton area as well as Route 347 and 373 which I had documented in my research.
- I then proceeded to make the design in Paint 3D using the Pixel pen tool and I am planning on using this tool possibly as the tool for the final design.
- This is because the thickness of the Pixel pen can be as low as 1px while other tools I had used cannot be lower than either 10px or 25px. As well as this, the tool has a great opacity compared to all of the other tools I have used so far as it doesn't have a color imbalance or only prominent paint in the middle of the line.
- The only issue to the Pixel pen is that it looks pixelated when zoomed in but that is to be expected as it is supposed to seem pixelated as obvious by the name of the tool.
- I plan on doing one more design and from there choosing the final tool I will use for the creation of my final artefact.

How well the artefact meets the original brief

- My artefact meets my original brief to a very high standard, as it implements abstraction which I discussed in the original proposal form that I wanted to implement in my final artefact to sort of link over to my other subjects (in this case A Level Computer Science)
- I also utilised decomposition by identifying key areas where my artefact would mainly be based which I decided would be roads of Clay Tye Road and St Mary's Lane in Upminster.
- I successfully annotated my designs to show the major roads that my route travels along as well as the other connections that the service will link to in the form of railway stations.
- I successfully created this digital design map to show just how much residents are suffering without adequate transportation.

How well I managed at the different stages of the project

- I joined the EPQ a bit later than some other people in October which means that overall, I had less time to complete my project proposal form and so therefore the rest of my stages were affected by this, but I was mainly able to catch up and get heavily into the research by November.
- I believe I was able to manage quite successfully at being a project manager overall as I was able to meet most of the deadlines that I had set myself across the time from November to April however sometimes needed to extend my deadlines in the case of my research, skill development and during the production of my artefact. However, this was to ensure that my research would be of a higher quality with more different points being a part of this, while also making my skill development designs more like the final artefact and ensuring that I have enough time to complete my final artefact.
- I also was unable to access my painting program at sixth form so I could not make digital design maps while in my EPQ lessons however I had access to Paint 3D at home and so therefore was able to solve that issue and make digital design maps.
- I did sometimes lose focus during my development process, and this was because this topic is a very diverse topic that I was passionate about but however I was able to mainly mitigate this by researching articles that were relevant while overall being part of my lost focus were very strong articles in the research portfolio.

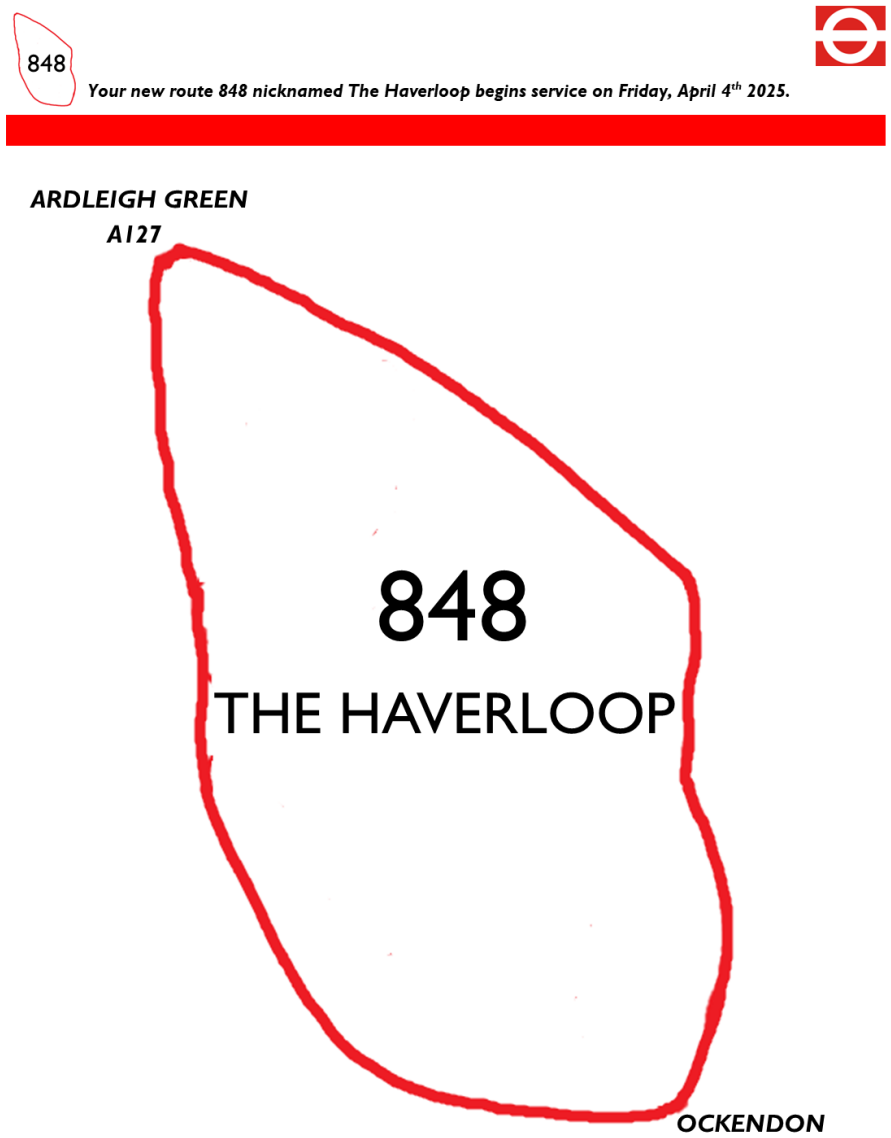
What I would do differently next time and why

- The things that I believe I would do differently next time is ensure that I have enough time to meet my deadlines on the first occasion so that way I do not have to worry about a knock-on effect onto other parts of the project and then I get the full amount of time that is required of me for my project.
- I would also ensure that I was able to get more primary research instead of heavily relying on secondary sources to back up my project so that I have exact sources of how the community around me feels.
- I would also ensure I am able to use my specific software in sixth form college so that way I could work on digital design maps during my EPQ and not entirely at home which could make me have less pressure overall.

A succinct summary of the main features of my artefact

- The main features of my artefact include an abstract design on the first page of my publisher file of the route in the shape of an oval with the main destinations included being Ardleigh Green (A127) in the north and Ockendon in the south.
- On the second page, I have included an abstract digital design map which meets my project proposal form as it only includes the main roads that it serves in the areas. I also included the main towns from which I showed local connections from which people can transfer to from this route.
- On the third page, I have included a timetable of the route that I have created which shows that I have met my skills of decomposition as I have identified areas within the local community which are suffering with very poor transportation. This includes a Monday to Saturday service, alongside a Sunday to Bank Holiday service.

My final artefact – Page 1



My final artefact – Page 2

My final artefact – Page 3

848 ***Your new timetable***

848 Ardleigh Green - Upminster - Ockendon - Hacton - Ardleigh Green

Monday to Saturday

Ardleigh Green *Redden Court Road*	0700	0815	0930	1115	1310	1509	1705	1810	2030
Upminster *Hall Lane*	0708	0823	0938	1123	1318	1517	1713	1818	2038
Upminster Station	0713	0828	0943	1128	1323	1522	1718	1823	2043
North Ockendon *White Horse*	0723	0838	0953	1138	1333	1532	1728	1833	2053
Ockendon Station	0728	0843	0958	1143	1338	1537	1733	1838	2058
Aveley Road *White Post Wood*	0736	0851	1006	1151	1346	1543	1741	1846	2106
Hornchurch *Hacton Lane Estate*	0741	0856	1011	1156	1351	1548	1746	1851	2111
New City College *Havering Sixth Form*	0743	0858	1013	1158	1353	1550	1748	1853	2113
Southend Arterial Road	0752	0907	1022	1207	1402	1559	1757	1902	2121
Ardleigh Green *Ardleigh Green Road*	0753	0908	1023	1208	1403	1600	1758	1903	2122
Ardleigh Green *Redden Court Road*	0755	0910	1025	1210	1405	1602	1800	1905	2124

848 Ardleigh Green - Upminster - Ockendon - Hacton - Ardleigh Green

Sundays and Bank Holidays

Ardleigh Green *Redden Court Road*	0930	1115	1310	1509	1705	1810
Upminster *Hall Lane*	0938	1123	1318	1517	1713	1818
Upminster Station	0943	1128	1323	1522	1718	1823
North Ockendon *White Horse*	0953	1138	1333	1532	1728	1833
Ockendon Station	0958	1143	1338	1537	1733	1838
Aveley Road *White Post Wood*	1006	1151	1346	1543	1741	1846
Hornchurch *Hacton Lane Estate*	1011	1156	1351	1548	1746	1851
New City College *Havering Sixth Form*	1013	1158	1353	1550	1748	1853
Southend Arterial Road	1022	1207	1402	1559	1757	1902
Ardleigh Green *Ardleigh Green Road*	1023	1208	1403	1600	1758	1903
Ardleigh Green *Redden Court Road*	1025	1210	1405	1602	1800	1905

Conclusion

- Do I still feel that Havering is isolated in terms of public transportation? Kind of and this is because several areas in the borough such as Aveley Road in Upminster, parts of Rainham, Cranham, North Ockendon and many other areas are still isolated with no form of public transportation for them to use.
- Do I still feel that Transport for London doesn't care about Havering and withdrawing routes? To be honest, 50% yes and 50% no and this is because they recently are planning on introducing route SL12 between Gants Hill and Rainham, Ferry Lane which will support residents in the area
- Would I research this specific topic again after my EPQ has ended? Yes, and this is because I am passionate about transportation in the borough, and I always hear about how transportation in this borough has been declining for at least 20 years.